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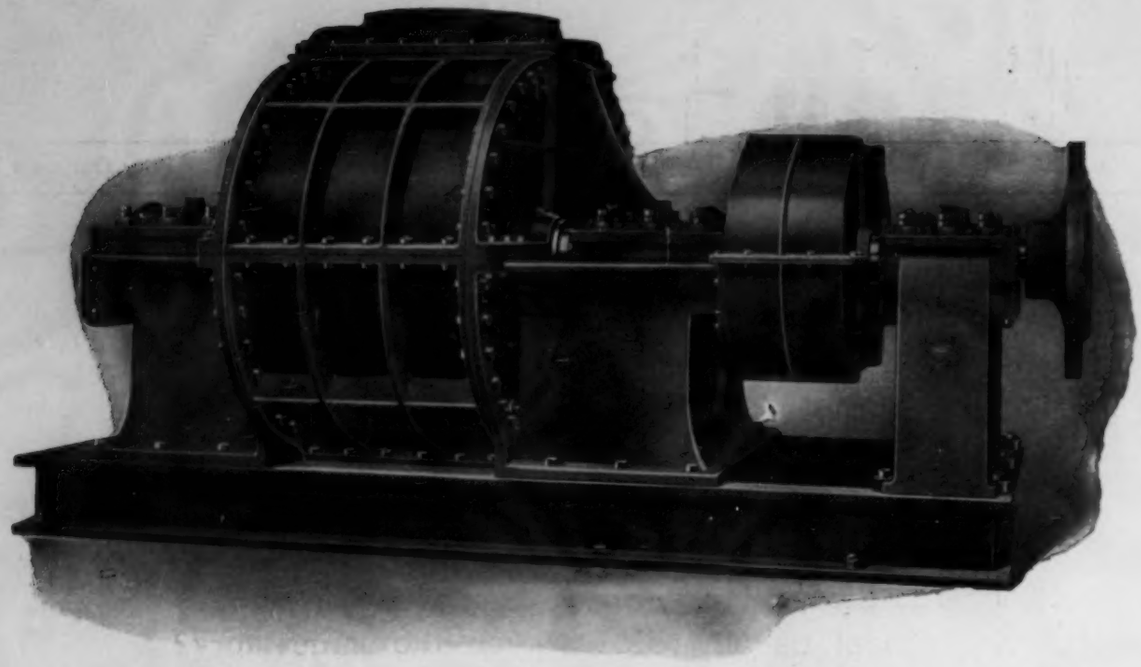

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THE IRON TRADE REVIEW

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Steel Squares Away for Great Year

Manufacturing Conditions Grow More Favorable and Prospects Promise Further Gains—Steady Advances in Pig Iron and Finished Steel Lines Are Reported From All Sections of Country

MORE favorable manufacturing conditions have resulted from somewhat better car service and improved outside working conditions due to greatly ameliorated weather conditions. Primarily this has led to larger production both of pig iron and finished steel in the past week and also to a slight decline in the Connellsville coke market. Other iron and steel commodities show every indication of further advances in quotations. Iron and steel tubular goods went up in the week $4 a ton, with some exceptions, which are $6 a ton higher, this being the second wrought pipe advance in the month. Wire products also have advanced $4 a ton, making nails $3.20, Pittsburgh, the highest price for nails since December, 1899. Ship steel in the east is bringing $20 a ton higher under the stimulus of heavy vessel contracting and even better ship building prospects. Light steel rails have been marked up $5 a ton.

Pig Iron

Pig iron in every section of the country is showing undoubted tendencies toward further price advances. In the south, while production has been maintained fairly steadily, yet demand has overtaken it. Sales have been made recently around $25 for No. 2 foundry, yet most furnace interests have withdrawn from the market and others are asking $30, Birmingham, for last half year delivery. Virginia furnaces in some instances are selling into early 1918, at slightly below today's quotation. Eastern Pennsylvania foundry iron sells freely at $35, furnace, and eastern low phos iron as high as $65, furnace. An element that appeared in the Pittsburgh district recently to keep basic iron around $30, valley, was the entrance into the market of considerable tonnages of this grade sold by steel works whose finishing mills were hampered by lack of fuel. These tonnages have been absorbed from the market. The production of coke and anthracite pig iron in February was 2,653,035 tons, a decrease of 506,804 tons compared with January. Although February had three fewer working days than January, yet this decrease likely is due to less favorable working conditions growing out of the adverse weather and car service difficulties.

Plates

Ship yards have contracted for 15 to 20 additional ocean vessels, some of them for foreign owners, and flattering prospects include even a larger number. Demand upon mills has brought out an advance of $10 a ton for tank plates and $20 for ship plates, while ship angles in the east are rising to the level of plates. Marine boiler steel has sold in the east at the extraordinary price of 15.40c a pound. In the middle west the usual quotation for prompt plates ranges from 5c to 6c.

Railroad Buying

The Pennsylvania railroad has distributed 68,000 tons of 100 and 130-pound steel rails for 1918 delivery. This is only one-third of its original tonnage inquiry withdrawn some time ago. These rails have been divided among four mills. The French car order for 10,000 to 12,000 cars has gone to the Standard Steel Car Co. Spain is figuring here in the car market. Domestic car buying is quiet, but locomotive buying is steady.

Finished Material

Steel bars are more active in the east and middle west, where the smaller implement makers are placing additional tonnages, on some of which 3c up to 3.25c has been quoted. Bar iron is firmer. Nuts, bolts and rivet quotations are growing stronger and prices may advance. The sheet market continues to reflect tighter conditions with sheet bar supply difficulties increasing steadily in the central west. Forging steel supplies are almost nil in these districts. Scrap is not showing much improvement.

Ferro Alloys

Sellers of English ferro-manganese have been advised by their principals of withdrawal of the $185, seaboard, price for delivery after July 1. Domestic makers of metal are firmer in their ideas of prices.

THE OPEN HEARTH

A Time for High Leadership

WITH the issues of peace or war between the United States and Germany now hanging by a slender thread, a moment for grave deliberation on the part of the iron and steel manufacturers of this country is at hand. The European cataclysm has demonstrated beyond all question, the supreme importance of iron and steel in modern warfare. The United States is blessed signally in productive capacity of this character.

Will this tremendous industrial power be realized fully if the supreme test comes?

The question largely is one of the quality of leadership. Reports from Washington are to the effect that the President is preparing to recruit the services of men prominent in transportation, merchandizing and other fields for directing the various functions of a war situation, should they be required. It is of the utmost importance to the nation that the ablest and strongest personalities in the iron and steel industry be called to this council board and be clothed with the fullest authority that the occasion demands.

If war comes, there should be room for none but the master minds among the President's first aids and advisers. Several names in the iron and steel industry readily suggest themselves for this great duty. Selections among these will insure the most efficient mobilization and application of the industry's inherent war strength, and will command the most zealous co-operation of all their fellow manufacturers.

Facing Facts About Accidents

STATISTICS are frequently misinterpreted and twisted to back up some pet theory or prejudice. The old saying that figures don't lie is a half truth, and figures without an interpretation often convey information which is far from actual facts.

The Conference Board on Safety and Sanitation, of which Magnus W. Alexander is executive secretary, has just issued a most interesting and illuminating pamphlet under the title "Facing the Facts". This booklet shows that straight statistical thinking is possible. It presents figures on industrial accidents so analyzed as to show to what extent workers actually are being injured and the decrease which has been brought about by modern safety efforts. A dialogue form has been adopted in a way to make most interesting reading, and in the course of the conversation, various friendly and unfriendly interests are brought forward, to assist in bringing out the actual facts.

To clothe dry state and government reports with a garment of interest is a distinct service, and in the present instance, a great deal of valuable information is presented which ordinary readers never would gain by examination of the original figures.

The morbid-minded person who simply reads that a certain number of thousands of workers were injured in industrial occupations during a certain year, might not feel so gloomy if he analyzed the figures and discovered that probably six-sevenths of the injuries reported are such as would not be noticed had they occurred in the home or in the garden. The sensitive citizen also would be comforted if it were pointed out to him that about one-third of 1 per cent are fatal injuries, about 1 per cent result in permanent crippling, and the remainder are minor injuries.

A number of surprising comparisons are made in the pamphlet. For instance, of 370 fatal accidents in Massachusetts during a certain year, 95 occurred in factories, while 275 occurred in street and building construction, on railways, and other work, outside of factories. During the same period, 374 deaths from whooping cough and measles occurred among children. The remarkable fact is set forth that industrial work is really the safest occupation in this country. The reports of the United States government are cited to show that in all factories, mines, railroads, steel mills, and other industries, one worker out of each 1,500 is killed annually. Outside of industry, one out of every 1,000 is killed annually. But in manufacturing only one out of 4,000 is killed annually. The fact is surprising, but true, that in farming one out of every 2,900 meets death each year; this represents considerably more of a hazard than the one in 4,000 in general manufacturing.

It is deduced from dry statistics that the law of gravitation is responsible for the most and the worst accidents, not excepting machinery. More men and women are crippled or killed from falling or because something falls on them, than from any other cause. Four times as many people are drowned every year as are killed by machinery. This includes those drowned while bent on pleasure and those drowned in the pursuit of business. The moral is found in the application of the universal remedy—"Personal Caution is the Greatest Safeguard."

Two Apposite Opinions

THE presidents of the Donner Steel Co. and the Chicago Railway Equipment Co., in their respective annual reports to stockholders, each dwell upon a number of serious problems that have been developed directly or indirectly by the wave of prosperity which started to sweep over this country shortly after the outbreak of the war in Europe. Both men have studied the market situation for iron

THE OPEN HEARTH

and steel products closely for a number of years. Their opinions are exceedingly apposite.

W. H. Donner, of the Donner Steel Co., says: "Two conditions have developed that will be serious problems in the future," as a result of high prices and exceptional activities. These conditions are: *First,* an expansion in the industry considerably beyond normal requirements, and, *second,* increased costs. With reference to the first condition, *The Iron Trade Review,* on Jan. 4, 1917, pointed out that the construction of 257 open hearth furnaces was either completed or begun in the United States and Canada during the first 28 months of the war. In 1916, three new blast furnace stacks were blown in, and 21 were under construction on Jan. 1, 1917. As soon as the foreign demand is relieved and the accumulated orders are overtaken, Mr. Donner says an over-production will be noted and a decline in prices will follow. Among the factors working toward an increase in costs, the president of the Donner Steel Co. includes the several advances in wages to laborers, advances in prices of raw material, and increases in the cost of transportation, all of which have tended to complicate the general situation.

One of the most serious problems developed during the present period of prosperity, in the opinion of E. B. Leigh, president of the Chicago Railway & Equipment Co., is the attitude of labor, which he describes as an economic and sociological problem, the solution of which will tax the resourcefulness and abilities of our ablest lawyers, statesmen and industrial leaders. Another problem commented upon by the head of the railway equipment company, is found in the vast tonnages carried by our railroads during the remarkable year of 1916. Because of the heavy freight movement and consequent increase in revenue, many people believe that the "railroad problem" has been solved, but such is not the case, Mr. Leigh declares. He believes, however, that the enactment of the legislation under consideration will place our railroads upon a reasonable business basis, enabling them eventually to purchase new and replace old equipment, without jeopardizing their interests, thus preventing a repetition of the intolerable traffic conditions existing today.

Price Trend is Still Upward

MANY members of the iron trade, in keeping abreast of recent international developments and in attempting to ferret out a loaded freight car here and there, have not followed closely the trend of prices of raw and finished commodities. Principally because the iron trade has been less excited, many people entertain the belief that the upward trend of prices was arrested some time ago. An analysis of quotations offered by *The Iron Trade Review,* shows that such has not been the case. Prices of most materials have continued their march toward higher levels, despite peace talk, the submarine activity, the break in diplomatic relations with Germany, and the possibilities of war. Our exports temporarily have been affected by the activity of the German U-boats, material passing through the New York custom house in the week ending Feb. 17, falling off about 50 per cent in value. This, however, has caused little alarm or apprehension. Mill managers realize that domestic demand readily will absorb tonnages intended for delivery abroad, in the event that foreign shipments are out of the question entirely.

In the half-year period ending Feb. 28, bessemer pig iron advanced $14; basic, $12; No. 2 foundry, $16; billets and sheet bars, $20; plates, $17; steel bars, $8; black sheets, $40; nails, $8; heavy melting steel, $5.50; spot furnace coke, $8.20, and spot foundry coke, $9.75 a ton, Pittsburgh. In the six-months period beginning March 1, 1916, bessemer pig iron advanced $1; basic pig iron, $0.25; foundry iron, $7; billets, $7; sheet bars, $5; plates, $11; bars, $7; sheets, $3; nails, $6, while heavy melting steel, spot furnace coke and spot foundry coke declined $1, $0.70 and $0.50 a ton, respectively. Comparisons indicate that the advances during the last half of the year just ended were much sharper than those recorded in the first half.

Iron and steel scrap is the only commodity of importance to register declines in price since Dec. 12, 1916, when Germany and her allies opened negotiations for peace with the nations with which they are at war. Heavy melting steel has declined about $5 a ton since talk of peace first was heard. It is not believed, however, that the overtures of the Central Powers have had anything to do with the recessions in the prices of old iron and steel materials. Since Dec. 12, No. 2 foundry has advanced $4; billets, sheet bars, plates and black sheets, $5; steel bars, $2; and spot furnace coke and spot foundry coke, $4 a ton, at Pittsburgh. Prices of bessemer and basic pig iron and wire nails have remained stationary since the latter part of November. All three products, however, reflect strength.

While it is too early to determine with any degree of accuracy what the trend of prices will be if the United States becomes involved in the great war, it generally is thought that the iron market will not be affected adversely. In fact, usually well informed observers predict that all commodities will advance sharply in price, if this country enters the struggle.

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago.)

Quotations on leading products March 7, average for February, 1917, average for December, 1916, and average for March, 1916. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices Mar. 7, 1917.	Aver. for Feb., 1917.	Aver. for Dec., 1916.	Aver. for Mar., 1916.
Bessemer pig iron, Pittsburgh	$36.95	$35.95	$35.95	$21.55
Basic pig iron, Pittsburgh	30.95	30.95	30.95	19.20
No. 2 Fdy. pig iron, Pittsburgh	35.95	33.95	31.70	14.45
Northern No. 2, Fdy., Chicago	34.00	30.00	25.00	18.50
Lake Superior Charcoal, Chgo.	35.75	33.75	21.95	19.50
Malleable, Chicago	34.00	30.00	25.00	19.00
Southern No. 2, Birmingham	27.00	24.50	22.25	15.00
Southern Ohio No. 2, Ironton	35.00	33.00	29.50	18.30
Basic, eastern Pa	33.00	30.50	25.50	19.50
No. 2X Virginia, furnace	32.00	26.50	23.75	18.00
No. 2X foundry, Philadelphia	34.50	30.50	25.25	20.00
Ferro mang., delivered	275.00	175.00	155.00*	140.00*
Bessemer billets, Pbgh	65.00	62.50	58.75	40.60
Bess. sheet bars, Pbgh	65.00	62.50	58.75	41.00
Op.-h'th sh. bars, Pbgh	65.00	62,50	58.75	41.00
Open-hearth billets, Pbgh	65.00	62.50	58.75	40.60
Steel bars, Pittsburgh contract	3.00	3.00	2.925	2.34
Steel bars, Chgo	3.19	3.19	2.89	2.23
Iron bars, Philadelphia	3.409	3.159	2.659	2.259
Iron bars, Cleveland, local del'y	3.00	3.00	2.70	2.29

*Seaboard.

	Prices Mar. 7, 1917.	Aver. for Feb., 1917.	Aver. for Dec., 1916.	Aver. for Mar., 1916.
Iron bars, Chgo. mill	$3.00	$3.00	$2.52	$1.91
Beams, Chgo. contr.	3.44	3.29	3.03	2.22
Beams, Pittsburgh, contr.	3.25	3.25	3.025	2.40
Beams, Philadelphia	3.659	3.509	3.109	2.209
Tank plates, Pbgh., contr.	3.75	3.75	3.525	2.50
Tank plates, Chicago, contract	3.94	3.98	3.46	2.33
Tank plates, Philadelphia	5.159	4.909	4.159	2.659
Sheets, blk., No. 28, Pbgh	5.00	4.565	4.50	2.75
Sheets, blue anl., No. 10, Pbgh.	4.75	4.375	4.00	2.87
Sheets, galv., No. 28, Pbgh	6.75	6.50	6.25	4.82
Wire nails, Pittsburgh	3.20	3.00	3.00	2.38
Connellsville fur. coke, contr.	8.00	8.00	4.44	2.80
Connellsville fdy. coke, contr.	7.00	6.50	6.00	3.90
Heavy melting steel, Pbgh	23.00	21.875	25.00	17.95
Heavy melting steel, eastern Pa.	22.50	21.50	19.50	16.50
Heavy melting steel, Chgo	22.00	20.25	19.35	15.25
No. 1 wrought eastern Pa	29.50	26.50	24.00	22.50
No. 1 wrought, Chgo	25.00	23.75	21.25	14.95
Rerolling rails, Chgo	26.50	27.25	24.90	17.12
Car wheels, Chgo	19.50	19.75	15.95	14.06

(For Additional Prices See Page 600.)

Iron Rises Steadily on Active Demand

Bessemer is Held Higher at Pittsburgh While Furnaces in Virginia, Alabama and Tennessee Quote Foundry Iron at Higher Prices and Get Them—Sales Made Into Next Year

Pittsburgh, March 6.—Sellers of pig iron at Pittsburgh now are asking $37, valley, for standard bessemer iron for both prompt and future delivery. Scattering lots, ranging from 100 to 600 tons of this grade, have been sold at $36, valley. A West Virginia melter is in the market for 5,000 tons and an eastern interest wants 20,000 tons of bessemer iron for prompt delivery. Basic pig iron is quiet, and no change is noted in the prevailing price, $30, valley. Rather heavy tonnages of No. 2 foundry iron have been sold on the basis of $38, valley, at which figure several dealers are holding both foundry and malleable grades. Many melters are attempting to cover requirements for the first half of 1918. Sellers of Virginia iron have opened books for that delivery on the basis of $31 for No. 2X and $30.75, furnace, for No. 2 plain. Heavy tonnages of Virginia and southern iron are being shipped to melters in this district.

Shipments of blast furnace fuel are described as much more satisfactory than they were a week ago. The Carnegie Steel Co. has only one furnace banked for want of fuel. Other blast furnace owners say shipments of coke are just about normal.

The average prices of bessemer and basic pig iron in February were $35.418 and $30, valley, respectively, according to compilations made by W. P. Snyder & Co. Average prices are based upon sales of 1,000 tons or more, by valley furnaces. The average price of bessemer pig iron last month was $0.418 above the average price established in January. In February of 1916, bessemer iron sold at an average price of $20.2136; in the corresponding period of the year of 1915, this grade was established at an average of $13.60, valley. The average price of basic pig iron has remained stationary for more than 90 days. In February of 1916, basic pig iron sold at an average of $17.984; in the corresponding period of 1915, this grade sold at an average price of $12.50, valley.

Inquiry Heavy; Prices Rise

Philadelphia, March 5.—Heavier buying and new price advances in pig iron are being sustained. Coke conditions are better, but some banking of furnaces persists. Spot iron continues to sell at some advances over former. Buying is spread over all deliveries up to Jan. 1, and there has been a slight interest in the first half of 1918. Virginia foundry for the latter period has been sold at $30.50, furnace, for No. 2X. The Virginia Iron, Coal & Coke Co. now has issued a new schedule for the first half of 1918, holding No. 1 soft at $32, furnace, No. 1 foundry at $31.50, No. 2X at $31 and the lower silicons at the usual 25-cent differential between grades. This maker has indicated it would not accept less than $36 for No. 2X for the last half of the year. Early Virginia iron also is lacking in price uniformity. Most makers want $32 to $34, furnace, for No. 2X, but there have been early sales of one brand at $30, delivered eastern Pennsylvania, or $27, furnace. Chief among the week's sales have been 20,000 to 25,000 tons of Alabama lower silicon for forward delivery to the United States Cast Iron Pipe & Foundry Co. This iron is understood to have been obtained under $24, Birmingham, for No. 2, and was taken largely from one maker. This pro-

(*For complete prices see page* 600.)

ducer, it is said, still will accept $24.50 to $25, Birmingham, for No. 2, but other makers ask more and sales at $26 and $26.50 in this territory are noted. Alabama iron at these figures still represents a delivered price in this district $3 to $4 a ton under eastern Pennsylvania brands. The latter range from $34 to $35, furnace, for No. 2X, with some fair sales at the top level. Spot carloads brought $36, furnace, this week. The Baldwin Locomotive Works has closed its inquiry for 3,000 to 5,000 tons of lower silicon, most of which went to a northern maker at slightly under $32, delivered. The National Radiator Co. placed a 6,000-ton inquiry, taking both northern and southern. The Standard Cast Iron Pipe & Foundry Co. is credited with closing 5,000 tons of low silicon. Small lots of basic have been taken at $33, eastern Pennsylvania furnace, and there are other negotiations. A Philadelphia buyer wants 1,700 tons of mixed grades, including 1,100 tons of malleable and 500 tons of basic. Charcoal malleable for delivery after July was sold this week at about $42, delivered, and several thousand tons of this grade are pending. Low phosphorus again has advanced. A spot sale of 200 tons of Lebanon high silicon low phosphorus was at $65, furnace. Some makers of standard iron ask this price and $60, furnace, is minimum. An eastern Pennsylvania buyer is closing 3,000 tons of low phosphorus for last half. Rolling mills are inquiring for forge, one for 3,000 and another for 1,000 tons. Close to $32, delivered eastern Pennsylvania, has been named on this grade.

A leading eastern Pennsylvania steel maker is negotiating for 12,000 to 15,000 tons of basic for last quarter delivery.

Buyers are Closing

New York, March 6.—Determination of consumers of iron not to be deterred by high prices in covering themselves far ahead, has become more pronounced. Some of them now are beginning to extend their interest into the first half of 1918. Several sales for that period, both of Virginia and northern brands, have been made within and without this district. These have displayed a willingness of the makers to fix their present views of the market after Jan. 1, 1918, at from about $5 a ton under those for the last six months of the present year. Virginia iron for next year has been sold both at $30.50 and at $31, furnace, and the latter now is the open price of the largest maker for January to July of 1918. A Providence buyer has asked 3,250 tons of several grades for the last half of 1917 or the first half of 1918. Connecticut plants have bought several good-sized lots this week, for various deliveries. One took 2,000 tons of malleable and another 1,000 to 1,500 tons of foundry. A third consumer wants about 2,000 tons of malleable. In New Jersey, a sewing machine manufacturer bought 3,000 tons, chiefly southern, for a western plant; a stovemaker took 2,000 tons of early foundry. Henry R. Worthington, Inc., has asked 5,000 tons of high silicon foundry for Harrison, N. J., for delivery to begin at once. A 2,000-ton lot of malleable for a Michigan plant is wanted by an eastern company. The list of smaller inquiries and sales is growing. Pennsylvania brands of iron are held from $34.75 to $35.75, tidewater, or $33 to $35, furnace, for No. 2X. Spot sales are at $36. A Virginia maker, who was asking $32, furnace, has advanced to $34 or $37, Jersey City, which is the minimum most Virginia producers now are naming. The Musconetcong, N. J., furnace may resume if coke can be had. Heavy export inquiries show no cessation. For Kobe, Japan, 8,000 tons of foundry are wanted. A 4,000-ton lot of low phosphorus, on which $60, eastern furnace, has been quoted, is up for the same country. New requests include 10,000 tons of bessemer for Italy by one New York exporter; 24,000 of bessemer for Italy and 6,000 tons of low silicon for France from another buyer; 21,000 tons of bessemer, 30,000 tons of basic, 2,000 to 5,000 tons of low phosphorus and 1,000 tons of foundry, all for another house for France, Italy and Russia; 2,000 tons of low phosphorus for Scandinavia and many others. Sales still are discouraged by shipping conditions, though the latter are improving.

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Pig Iron Up to $40

Buffalo, March 6.—In the face of the demand for prompt shipment lots, both large and small, for iron of the various grades, furnace interests of the district generally have advanced prices to $37 to $40 with little or no distinction being made as to grades. Where a producing interest has any iron whatever to sell, it is as easy to get $37 to $40 for the low silicon and off grades as it is to book urgent needs at these figures for the higher silicon runs of foundry irons, malleable and basic. Charcoal irons are being held at $38 to $40.

Melters are coming into the market for their needs for second quarter and for last half of the present year, and some interests are seeking to have the producers book tonnages for deliveries running into 1918; but the furnaces are not inclined to consider anything for delivery beyond the end of the current year. In the aggregate the inquiry amounts to a considerable tonnage, made up of small lots and carloads for prompt or early delivery where either is obtainable.

With the furnaces of the district sold up solidly, or as nearly so as possible, over the remainder of the year, iron from other districts becoming harder to obtain and yard stocks and resale iron practically wiped off of the slate, it is figured producers will be in a position to satisfy only a small portion of the needs of the consumers now clamoring for iron.

Embargoes and freight congestion in the past month or so have tended to intensify the situation, making the needs of the melters more urgent and a factor in the most recent advances in prices that have taken place.

Inquiries Come In Freely

Cleveland, March 6.—The demand for pig iron continues to outstrip the supply which producers have for sale. Makers in this district are receiving inquiries from all parts of the country, but owing to the large tonnage already booked for this year, producers are quoting on only a portion of the inquiries. Sales during the past week were somewhat larger than in any one of the immediately preceding weeks, although the aggregate tonnage disposed of was small. No. 2 foundry iron continues to command as high as $38, furnace, for delivery before July 1. For second half delivery, iron is held at a minimum of $35, furnace. Both sellers and buyers are placing less emphasis upon grades in their desire to expe-

(*For complete prices see page* 600.)

dite deliveries. One maker this week sold iron carrying 5 per cent silicon on the same basis as standard No. 2 foundry. Shipments continue to improve slowly and railroads are handling material in and out of plants in better shape.

Malleable Inquiry Active

Chicago, March 6.—An increased inquiry for malleable iron is evident in the Chicago market. For the most part it is for small tonnages, but one buyer is about to close for 3,600 tons for last half year delivery. The same buyer recently bought 1,000 tons of the same grade. Foundry iron is less in demand, although melters are seeking some tonnage. Small lots of iron for immediate delivery are being sought and are selling at 50 cents a ton above the quotation for second half year. Sellers maintain $34, Chicago furnace, on malleable and foundry for last half year delivery.

Southern iron continues difficult to purchase and buyers find it almost impossible to obtain a quotation or place a contract. Southern furnaces apparently are well sold for delivery through the year, and some state they have nothing to offer short of 1918 delivery.

Ferro-manganese continues at $300 a ton for first and second quarter delivery, $275 for third quarter and $250 for fourth quarter.

The situation as to silveries remains unchanged and Lake Superior charcoal is quoted at the same figure as recently.

Southern Iron Higher

Cincinnati, March 6.—Only one southern maker of pig iron now will accept business for delivery in the last half year below $30, Birmingham. This producer will take a limited tonnage at $27 subject to confirmation before orders are placed. The majority of furnaces are out of the market for any delivery over 1917. Southern Ohio stacks have all withdrawn from the market, but a little foundry iron probably could be had around $35, Ironton basis, for the last half year. No figures are available for silvery iron. Inquiry is light and unimportant.

Southern Makers Ask $30

Birmingham, Ala., March 6.—Southern pig iron manufacturers in asking $30 a ton for No. 2 foundry, basic and soft, for last half year delivery, are practically out of the market. Sales were made during the latter part of the past week on a level of $26 a ton, but the statement was reiterated that the product is worth more and in comparison with the prices that are prevailing in the north, $28, and even $30, was none too high. Three of the active companies in the Birmingham district have announced entire withdrawal from the market, and in one instance it was stated that the probable output for some months had been oversold. There was a little relief recently in the railroad situation. For a day or so there was some lifting of embargoes, and prompt advantage was taken thereof. The southern railroads are furnishing more cars but the embargoes still are strong. Representatives of southern pig iron producers at the southeastern ports, looking after iron movements into the eastern section, have been accomplishing something and quite an amount of iron has left this section recently for New England points. Unless one is a regular customer it is difficult to get any iron at all for the first half of this year and furnace interests feel confident the next advance in price will be from $26 to $30, the latter quotation being heard of already on all sides. Inquiries still are numerous, not including those from small foundries in various parts of the southern territories which cannot take on more than a car of iron at a time. Little is to be heard in this section in regard to export business, the furnacemen having their hands full looking after the domestic business. Home consumption continues strong; the cast iron pipe companies melting steadily, with a number of orders expected in the near future notwithstanding the $1 a ton advance in price, 4-inch pipe being advanced to $40 and the 6-inch and larger pipe to $37.50 and $38. Proprietors of foundries and machine shops report continued activity, with prospects for a continuation through the entire year. The steel plants in the southern territory are still producing at the maximum.

Charcoal iron is stronger and $28 is a minimum quotation, with the foundry output showing but little, if any, improvement.

Fair-Sized Inquiries in St. Louis

St. Louis, March 3.—Two fair inquiries for pig iron came to the surface of the St. Louis market last week. One of these was for 1,700 tons of southern foundry iron of various grades for shipment over the last half of the year. The other called for 1,000 tons of southern No. 2 foundry iron, also for delivery between July 1 and Dec. 31, 1917. Definite details were not forthcoming, but it was stated both inquiries came from Illinois millers.

The demand generally is good, and as has been the case for many weeks, much business is being turned down, because of the fact that southern producers supplying this territory are sold up, and those having some iron are minus cars. Deliveries on contract continue extremely discouraging, and have resulted in numerous consumers being forced into the open market for urgent requirements. Brokers and speculators, who had purchased at considerably lower levels, have some little pig iron coming along from time to time, and sales covering these stocks constitute most of the current business. By the end of May all this speculative stuff will have been moved, and barring some radical change, the market will be at an entire standstill. Accurate prices are difficult to obtain at the moment, but a range of from $26 to $30, Birmingham, for No. 2 foundry pig iron would, deliveries considered, about cover the situation.

(*For complete prices see page* 600.)

Buffalo Warehouses Have Named Advance

Buffalo, March 6.—Prices for plates from this district have advanced to 5.25c for ¼-inch and heavier up to and including 48; to 5.50c for over 48-inch, and to 5.75c for all over 72-inch, f. o. b. cars at destination. Sellers report an improvement in the freight situation although the congestion continues as a serious check against deliveries being made with reasonable promptness.

Sheets Advance

Cleveland, March 6.—Warehouse prices on No. 28 gage galvanized sheets rose sharply the first of the week. The prevailing price on these sheets is now $7.25; previous quotations have been $7.

Tin Plate Standstill

Pittsburgh, March 6.—The general market for tin plate is just about at a standstill, but this is not surprising, in view of the fact that scarcely any tonnage is available for delivery before July 1, next. Books for shipment after that date have not been opened. Heavy inquiry exists for shipment abroad, but tin plate makers are unable to entertain these negotiations, on account of the inability to meet their domestic obligations.

Andrew M. Coyle will address a meeting of the New York section of the American Society of Mechanical Engineers, to be held March 13 at the Engineering Societies building, 29 West Thirty-ninth street, New York. He will discuss the subject of coast defense, his paper being entitled "Mobile Armaments".

No Quotations Made

First Half Production of Sheet Bars Sold Out

Youngstown, O., March 6.—The practical impossibility of buying any sort of sheet bar tonnage for any delivery is turning would-be purchasers away from the valley. With the present nominal quotation at $70, and a shortage of raw materials in the offing, makers of semi-finished are shy about putting a price for future delivery on a product which they feel is certain to see greater values in the latter part of the year. First half year production is entirely sold out, and no last half quotations are being made.

Shipments both of fuel and raw materials into the plants have improved, a very little; the mills are working at from 80 to 85 per cent of their capacities.

Forging Steel Scarcer

Philadelphia, March 5.—Shortages of steel are resulting in some enforced shutdowns among eastern consumers, notably among the forging manufacturers. Others are operating in an uncertain way. Forging billets are scarce and eastern makers say if they had any for sale they would ask $100, mill. Rerollers nominally are $65, eastern mill. The Alan Wood Iron & Steel Co. is making steel in the first of its three new open hearth furnaces at Ivy Rock, Pa., which will add about 1,200 tons weekly to its output. The Lukens Iron & Steel Co. also is starting the first of its six additional furnaces of 100 tons capacity each at Coatesville. Wire rods are very strong. A western Pennsylvania maker sold a small lot of acid rods at $100, mill. New export sales of rods included 500 tons by a Philadelphia merchant at $83.75, New York, and 2,000 tons by another seller at $82.50, New York. A leading Youngstown maker is understood to have advanced to $85, mill.

Semi-Finished Command High Prices

Pittsburgh, March 6.—Virtually all makers of billets and sheet bars in the Greater Pittsburgh district now are asking $70, mill, for delivery before July 1. Scarcely any tonnage is available for early shipment. So far as can be learned, however, no tonnage has commanded more than $67.50, mill. It is suggested by some people in close touch with the situation that pressure for billets will be relieved by the withdrawal of munitionmakers from the market. It is too early to say how prices will be affected, if munitionmakers no longer figure in the market. The French government is negotiating for 200,000 tons of 5 x 5-inch and 6 x 6-inch billets for shipment before July 1, 1918. The material involved will be used for the manufacture of shrapnel shells. Forging billets have commanded as high as 5c a pound, although the general market continues to be quoted at $90 to $100, Pittsburgh. Manufacturers of wire rods are offering no formal quotations; wire rod nominally is listed at $75 to $85, Pittsburgh. Muck bar nominally is held at $50, Pittsburgh.

Are Buying Bars

First Half Orders Being Placed and Second Half Expected

Philadelphia, March 5.—Some of the smaller eastern implement manufacturers now are placing steel bar contracts for the last half year. In this territory such sales have been at 3.25c, Pittsburgh, or 3.409c, Philadelphia. Last half year sales have been made by certain mills to the implement trade in other eastern territory at 3c, Pittsburgh. At least two makers also have accepted this same price on miscellaneous last half year business with steel bar users in this district. Some additional second quarter contracting is expected soon. One maker continues to ask 3.50c, Pittsburgh, on some inquiries. Eastern bar iron has been advanced $5 a ton to 3.25c, Pittsburgh, or 3.409c, Philadelphia.

Bar Price Hardening

Pittsburgh, March 6.—Several manufacturers of steel bars have advanced their minimum price to 3.25c for shipment at their convenience. Others are refusing to accept new orders at any price, apparently not wanting to dispose of additional tonnages until the future situation becomes more certain. The Carnegie Steel Co. is quoting steel bars at 3c, but that price is regarded as nominal. A manufacturer of bar iron in this district has advanced his minimum price to 3.50c, although reports of sales at considerably less than that figure are heard. Demand for bar iron is described as heavy.

Steel Market Narrow

Chicago, March 6.—Practical withdrawal by the leading interest has narrowed the steel bar market to a great degree. This maker has been willing to take some tonnage for delivery during first half of 1918, but the present situation seems to be putting an end to this practice for the present. Demand for bars continues strong, but it is difficult to place business for delivery during the present year. The nominal quotation remains 3.19c, Chicago mill, but it is doubtful if an order can be placed at that figure. Hard steel bars continue to be contracted at 3c, Chicago, and every indication is that a strong demand will be made shortly for this material to be used in reinforced concrete construction.

Seek Last Half Bars

Cleveland, March 6.—Agricultural implement manufacturers are showing interest in last half contracts. The bar market has strengthened somewhat and rumors of an advance are circulating. Bar deliveries are far in arrears and some mills are now rolling on orders placed in the first quarter of 1916.

Bar Iron Holds Steady

Chicago, March 6.—Bar iron in the Chicago market continues steady at 3c, Chicago mill, although a decided advance has been made by eastern mills. The only effect of this action is to increase the quotation by western mills to eastern consumers. During the present winter, demand from points east has resulted in some sales and shipments into territory not ordinarily served from Chicago. On this material better prices have been obtained than on local deliveries.

Arrange Details

Sale of J. Wood Plant to Alan Wood Nearly Completed

Except for the formal details, the purchase of the plant of the J. Wood & Bros., Conshocken, Pa., has been negotiated by the Alan Wood Iron & Steel Co. The final transfer is expected to take place shortly. J. Wood & Bros., the origin of which dates back to 1832, is a manufacturer of blue annealed sheets. Its plant consists of 72 and 60-inch sheared plate and 44 and 56-inch sheet mills. It has been receiving its supply of crude steel from the works of the Alan Wood company, located close by. The company will continue to be operated by the new owners under its former name, and Jas. W. Wood, formerly vice president and general manager, will be continued as operating manager.

Chain Held at 6.50c

Pittsburgh, March 6.—Steel chain is being held at 6.50c by some manufacturers in this district. That price is $10 a ton above the prevailing minimum quotation. Ship building interests are prominent factors in the market.

(*For complete prices see page* 600.)

Ship Plates Flood Mills

Beside 15 to 20 Vessels Now Actually Closed, Many Others in Prospect—Marine Boiler Steel at Highest Price in History

New York, March 6.—The Cunard steamship interests continue to place contracts for ships with various yards in this country. Plant space is being taken up in whatever direction the best deliveries are obatinable. In some cases, stock boats which were under construction or laid out, have been purchased. The number of vessels actually closed to date is indefinite but it is believed to be not less than 15 to 20. The Bethlehem Steel Corporation has received six; the Todd Ship Building Corporation, Tacoma, Wash., has six 7,500-ton vessels; the Sun Ship Building Co., Chester, two 10,000-ton boats, while the Ames Ship Building & Dry Dock Co., Seattle, also has received some orders. Other companies are actively figuring on additional orders. The price at which some of these Cunard contracts recently have been placed is said to be $175, per ton. It is stated that a number of steel barges recently inquired for by Norwegian shipping interests here are intended for Russia.

Eastern Plates Advance

Philadelphia, March 5.—Piling up of a huge inquiry for plates before eastern makers has resulted in another extended advance in prices. Not less than three makers have raised ordinary tank plates $10 a ton or to 5.50c, Pittsburgh, and 5.659c, Philadelphia. Ship plates have been jumped 1 cent a pound or $20 a ton to 7c, mill or Pittsburgh, depending on the location of the sellers' works. Makers find their capacities are utterly unable to cope with the demand which is flowing in from all quarters, both domestic and foreign. The larger mills have sold so heavily that with the normal provision for regular customers, they have practically no tonnage left for this year. Japanese ship builders who were inquiring for 50,000 tons and have been offering 6c, mill, for any tonnage of this total for this year, were able to get 10,000 tons from one eastern mill. A 25,000-ton lot was sought actively but failed to go through. A new inquiry from a British ship yard called for 18,000 tons for six tank ships. China asked 6,000 tons and was quoted 6.50c, mill, for immediate acceptance by one eastern producer. A Barcelona, Spain, buyer is inquiring for 7,000 tons of hull and 750 tons of marine boiler plates. The Steel Corporation is reported to have negotiated one export sale of ship plates at 5c, Pittsburgh. Domestic users of tank plates are offering to contract as far ahead as the mills will accept. Some work which had been held back for several months because of the high prices now is being ordered ahead. This concerns, among other business, certain locomotive orders. Some important new purchases of the latter kind have been made. Some round tonnages of car plates also are sought. For tank cars, 7,000 tons are in the market. One builder recently inquired for a tonnage for French cars.

Plate Market Active

Pittsburgh, March 6.—Manufacturers of steel plates in western Pennsylvania have adopted rather cautious sales policies, even for future shipment. Inquiries of importance are being scrutinized closely and in most instances, they are being referred to officials of final authority for consideration. The Carnegie Steel Co. has made no change in its 3.75c price, but several concerns are asking 4.75c and 5c for nearby delivery. Ship plates are reported to have sold at as high as 7c a pound. Pending inquiries for ship plates involve approximately 60,000 tons; many of these inquiries, however, are tentative in nature. Specifications against contracts this week were heavier than in the preceding 6-day period. Mill managers say new demand is more active.

Prices Are Firm

Cleveland, Feb. 6.—Demand for plates continues strong. Sales both at 6c and a little less have been made this week, the plates, it is understood, going to ship builders. The pressure for delivery is strong. Marine boiler steel is bringing from 9c to 10c in some cases, while one sale for prompt delivery was made at a little better than 15c. Ship builders on the Great Lakes are urging deliveries on plates which they need for vessels under contract for delivery this year.

Hungry for Plates

Chicago, March 6.—Ship building companies are besieging the market for steel plates for any delivery. Hardest pressure is being brought to bear for moderately near delivery, and as high as 6c, Pittsburgh, is being bid. It is known that a recent inquiry for more than 14,000 tons offered at 6c has been turned down by an important steelmaker. This called for delivery through much of the present year. Under present obligations, mills are unable to accept this attractive business, except to the detriment of business already booked. The nominal quotation on steel plates is 3.94c, Chicago mill, but little tonnage can be placed even at this figure.

Boiler Steel, the Prince

Philadelphia, March 6.—A sale of 150 tons of marine boiler plates has been made to a foreign buyer by an eastern mill at 15.40c, base mill, a pound, or $308, per net ton. This is the price which eastern buyers now are holding, having advanced during the week from 14.40c, mill. Such prices never have been approached in the past history of the American plate trade. At the beginning of 1916, marine boiler plates were around 5c, eastern mill. Boiler plates, Lloyds specifications, now are quoted by eastern makers at 8.40c, mill, and hull plates at 7c, mill.

(*For complete prices see page* 600.)

Talk Cast Pipe

Buyers in East Show Interest But Not in West

New York, March 6.—Both public and private buyers are beginning to take up the consideration of their requirements of pipe with new vigor and the market is showing a distinct improvement in volume. Expected price advances by makers have not yet materialized; in fact, some irregularity still obtains. It is thought however, that with the ascending pig iron market, some advances only are a question of days. Some of the cities, apparently are being aroused by the prospect of higher prices. Hartford, Conn., is a possible buyer in the near future of 6,500 tons of 42's and Canton, N. Y., is about to ask bids on 2,250 tons of 6 to 12's. R. D. Wood & Co. will obtain the 500-ton letting at Syracuse, N. Y., at $41.25, delivered, for the 4's and $38.25 for the other sizes. Rochester is taking bids this week on 1,000 tons of 3 to 20's.

Buy Little Cast Pipe

Chicago, March 6.—Cities continue to buy as little cast iron pipe as possible under present high prices. Either inquiries are not made, bids are rejected, or specifications are reduced largely to avoid the tremendous expenditure involved in buying a normal supply. A further advance in prices is expected to be made soon, following the advance of pig iron.

Sheet Market Grows Tighter

Demand Far Exceeds Supply in Valleys With Consumers Bidding Up Prices

Youngstown, O., March 6.—The sheet market in the Mahoning valley has tightened again. It is extremely difficult to buy even small lots, especially of black sheets, and the price list is stiffening right along. The traffic situation is improved slightly this week and the outlook at present is for still further improvement.

Some odd lots of black sheets may be bought as high as 5.85c for No. 28 bessemer; some tonnage may be sold to regular customers for as low as 5c, but these transactions are not the rule. Bessemer blue annealed No. 10 is quoted at 4.50c to 4.75c, and as high as 5c for special lots; No. 28 galvanized of the bessemer grade is held at 6.50c to 6.75c and up to 7c.

Demand for all kinds of sheets far exceeds supply, especially in the case of black. Domestic and foreign consumers are bidding hard against each other, with the result that the maker can get just about any price he chooses to fix upon such tonnages as he has to sell. Most of the business is for delivery as soon as possible; manufacturers are still averse to quoting for future delivery; much of the spot tonnage cannot be delivered for months.

Production in the valley this week averages from 80 to 85 per cent of capacity, except in the case of galvanized sheets, the manufacture of which is still badly crippled by delayed shipments of spelter and sulphuric acid. Hardly more than 35 to 40 per cent of the coating pots are in operation.

Spain Wants Heavy Sheets

Philadelphia, March 5.—A representative of a works at Barcelona, Spain, presented to eastern makers this week an inquiry for 2,000 tons of heavy sheets. Eastern makers have sold sheets so liberally at the price range of 4.75c to 5c, Pittsburgh, or 4.909c to 5.159c, Philadelphia, that they are about to withdraw the minimum figure. Buying extends well into the third quarter. The acquisition of the J. Wood & Bros. Co., Conshohocken, Pa., by the Alan Wood Iron & Steel Co. will materially increase the output of blue annealed sheets of the latter.

Third Quarter Material Wanted

Pittsburgh, March 6.—Consumers of steel sheets in all parts of the United States are telephoning and telegraphing manufacturers in an effort to cover third quarter requirements, but none of the mills in this district has opened books for delivery after July 1. Anxious buyers as far west as the Pacific coast have telephoned to sheetmakers in western Pennsylvania, asking prices for third quarter delivery. Sheets are being shipped by express to points in the east and central west.

Prices are hardening all along the line, although scarcely enough material is being sold to offer much insight into the price situation. Black sheets are selling at 4.75c to 5.75c, base. Galvanized material is commanding from 6.60c to 7.25c for No. 28 gage; blue annealed products are quoted at 4.50c to 5c for No. 10 gage. Less than 40 per cent of the galvanizing capacity of sheet mills is in use, on account of the scarcity and deferred shipments of spelter.

English Alloy Makers Out

Withdrawn From Market After Some Selling—Domestic Price for Future is Unchanged

New York, March 6.—After recent sales for the last half year, totaling perhaps 10,000 to 15,000 tons, most of the English makers of ferro-manganese now have withdrawn from the market for any position. Their former price of $185, seaboard, however, has not been changed. This is practically a nominal figure at present. Some further buying of both English and domestic ferro-manganese is being done by consumers for various deliveries prior to Jan. 1, 1918, but the market has been quieter the past week. A consumer in the St. Louis district closed for 400 to 500 tons for last half with a British maker. About 1,000 tons of domestic inquiry and 1,000 tons or more for Canada are current. It is evident that consumers are reluctant to pay a price of $300, delivered, for spot or early metal which the domestic makers have been quoting. A number of carloads are offered in the market at this price without takers. Less than carload sales have been made at $300, for spot delivery and carloads have been sold at $275, delivered. Forward domestic prices are unchanged, ranging from $200 to $250, depending upon the period. An eastern maker is out of the market except for last quarter. Ground ferro-manganese is selling at from 14 to 15 cents per pound, at the grinding plant.

Spiegeleisen also has produced less new business the past week. From 15,000 to 20,000 tons of inquiry, however, remain in the market. A 3,000-ton lot for an independent steelmaker, is thought to cover foreign bessemer rail business upon which the latter is figuring. A 10,000-ton lot also remains open. Early prices of spiegeleisen are very firm and $75 to $80, furnace, continues to be quoted. There is some variation on forward delivery, but the minimum seems to be $60, furnace, for last quarter. The third quarter is quoted informally at $65 to $70, furnace.

Spiegel Makers Buy Ore

Philadelphia, March 6.—Domestic makers of spiegeleisen have contracted recently for about 100,000 tons of manganiferous ores from the Cuyuna range and deliveries against these purchases are expected to begin at an early date. Shipping difficulties still block new sales of foreign manganese ore. Some inquiries now are pending, but sellers are unable to get freight room upon which to base definite quotations at seaboard. Some options on Brazilian ore at 80 cents per unit, at tidewater, have been extended.

Alloys Advance in Price

Pittsburgh, March 6.—Pittsburgh sellers of 80 per cent ferro-manganese have withdrawn prices previously quoted for English material, which was sold freely at $185, seaboard, for shipment after July 1. This material is being held at as high as $250 for future shipment, and some dealers are asking $300, delivered, for prompt shipment. Twenty per cent spiegeleisen is being quoted at $75 for prompt delivery, and 50 per cent ferro-silicon is held at as high as $235 for early shipment. Lower grades of bessemer ferro-silicon are quoted at $47 and above at the furnace for No. 10 per cent.

The Walter A. Zelnicker Supply Co., St. Louis, has purchased the track and appurtenances of the Idaho Southern railroad which formerly extended from Milner to Oakley, Idaho, a distance of about 50 miles.

(For complete prices see page 600.)

Government Seeking Steel

Structural Prospects in East and Middle West Brighter With Near Approach of Building Season

New York, March 6.—Prospects of new government work continue to represent an important phase of the eastern structural market. New York engineers have been commissioned to prepare plans for a new arsenal at Rock Island, Ill., which it is reported will cost $1,000,000. A call for bids will go out soon. The steel tonnage is not stated. A new gun shop about to come out, as previously stated, it is learned is to be located at Washington. Crane runways at the Puget Sound navy yard and a machine shop at the Mare Island navy yard are the subjects of present negotiations. Other government work is being talked about. New structural contracts of miscellaneous character show up heavy in eastern territory this week and total probably 10,000 tons. Inquiries are fairly liberal excepting for new jobs in the metropolis which are light for this season. Plain material prices show an upward tendency and 3.25c to 3.50c, Pittsburgh, or 3.419c to 3.669c, New York, still is quoted.

Ship Steel is Higher

Philadelphia, March 5.—Ship shapes have been advanced $10 a ton to a basis of 4.50c, Pittsburgh, by a leading eastern maker. This harmonizes with a sharp advance the past week in ship plates. This same producer is holding ordinary shapes at 4c, Pittsburgh, and reports the closing of some second quarter contracts at this figure. Another eastern shapemaker has moved up its minimum prices on ordinary shapes to 3.35c, Pittsburgh, or 3.509c, Philadelphia. The 3.25c, Pittsburgh, price is disappearing. Eastern mills rolling standard sections are being pressed hard for tonnages and they are careful to limit their sales to regular customers. The Lenoir, Tenn., car shops have distributed 2,000 tons of shapes among several eastern and one southern maker. The Southern railroad has issued a new inquiry for about 500 tons of small angles. A 9,000-ton plain material inquiry for new government work, believed to be for a gun shop at Washington, remains before eastern makers. Bids are to go in about April 1.

Structural Shapes Held Firmly

Pittsburgh, March 6.—Leading manufacturers of structural material are beginning to scrutinize inquiries more closely, apparently not wanting to obligate themselves further for future shipment. It is not unlikely that the minimum price of shapes will be advanced $3 to $5 a ton at an early date. Some manufacturers now are refusing to quote shapes at less than 3.50c. Fabricating shops are being operated at maximum capacity, although no large orders for structural material have been placed in this district recently.

Fair Structural Contracts

Chicago, March 6.—Apparently some construction which has been held back by the unusually high cost of structural material is now coming out. Projects closed in western territory during the past week involve a number of structures quite different from those of the last year. The largest item recently closed went to the Minneapolis Steel & Machinery Co., 600 tons, for a 10-ton ore bridge for the Calumet & Hecla Mining Co., at Calumet, Mich. The normal quotation on structural material is 3.44c, Chicago mill, but with the leading interest out of the market, this price is nominal.

CONTRACTS AWARDED.

Mead-Morrison Mfg. Co., 10-ton ore bridge for Calumet & Hecla Mining Co., at Calumet, Mich., 600 tons, to Minneapolis Steel & Machinery Co.

Foundry for Saginaw Malleable Iron Co., Saginaw, Mich., 456 tons, to Lewis-Hall Iron Works, Detroit, Mich.

First National Bank building at Danville, Ill., 406 tons.

Montana-Utah Sugar Co., sugar plant at Hamilton, Mont., 392 tons, to Minneapolis Steel & Machinery Co.

Tenth Church of Christ, Scientist, at 5650 Blackstone avenue, Chicago, 275 tons.

Building for the University of Michigan Union, at Ann Arbor, Mich., 273 tons, to Lewis-Hall Iron Works, Detroit.

Auditorium building at Howard and Ashland avenues, Chicago, 119 tons.

The Poe Engineering Co., Cleveland, for the structural steel runway for a material handling crane to the Bellefontane Bridge Co., Bellefontaine, O.

McIntosh & Seymour Corporation, building, Auburn, N. Y., taking 220 tons structural, contract to Lackawanna Bridge Co., Buffalo.

Bowles restaurant building, Buffalo, 100 tons structural, contract to Buffalo Structural Steel Co.

Rudolph Wurlitzer Mfg. Co., North Tonawanda, factory extension, 100 tons structural, contract to Progressive Steel Co., Buffalo.

Bridge at Deerfield, Mass., for Boston & Maine, 1,600 tons, to the American Bridge Co.

Bridge work for the Philadelphia & Reading railroad, 1,100 tons, of which 800 tons went to the Phoenix Bridge Co. and 300 tons to L. F. Shoemaker & Co.

Building for the General Electric Co., Lynn, Mass., 400 tons, to the New England Structural Co.

Odd Fellows hall, Washington, 500 tons to Barber & Ross.

Charging floor and gas house for proposed Worth steel works, Claymont, Del., 1,600 tons, to the Fort Pitt Bridge Works.

Keith theater, Syracuse, 600 tons, to Harris-Silver-Baker Co.

Buildings for Erie Forge Co., Erie, 1,500 tons, to Lackawanna Bridge Co.

CONTRACTS PENDING.

Highway bridge over New York state barge canal, 200 tons, American Bridge Co.

Union Carbide Co., Niagara Falls, N. Y., bids went in this week for plant addition, taking 200 tons structural.

Machine shop for the Mare Island, Cal., navy yard, 400 to 500 tons, bids being taken.

Post-office and customs house, Birmingham, Ala., 800 tons, Chas. McCall Co., Philadelphia, low bidder.

Addition to the Litt Bros. store, Philadelphia, 1,600 tons, bids about to be issued.

Power house and paper mill for Abitibi Paper Co., Iroquois Falls, Ont., 2,000 tons, bids being taken.

Turbine foundation, Perth Amboy, N. J., for Public Service Electric Co., 300 tons, bids being taken.

Government arsenal, Rock Island, Ill., Westinghouse, Church, Kerr Co., New York, engineers. Plans being prepared. Reported will cost $1,000,000.

(*For complete prices see page* 600.)

Pipe Prices Rise

Most Kinds of Steel and Iron Pipe Advance

Pittsburgh, March 6.—Manufacturers of tubular products, for the second time in less than a month, have advanced prices $4 a ton for all kinds of steel and iron pipe, except water well casing and 1¼-inch lap weld iron pipe, quotations of which were put up $6 a ton, effective March 5. No changes have been made in prices of boiler tubes since Nov. 20, 1916, but quotations adopted on that date are regarded as nominal.

The last previous change in prices of tubular goods was made Feb. 13 and 14, when quotations were advanced two points. Since March 1, 1916, prices of steel and iron butt-weld black pipe advanced $28 a ton; butt-weld galvanized pipe has advanced $22 a ton since that date. Ten changes have been made in prices of iron and steel welded products in the last 12 months.

The Gulf Refining Co., Pittsburgh, is in the market for 35,000 feet of 8-inch, 25-pound; 60,000 feet of 10-inch 32-pound; 250,000 feet of drill pipe, and 12,000 feet of 4½-inch special rotary pipe.

Wrought Pipe is Higher

Buffalo, March 6.—Standard wrought pipe has gone up two points all around, according to the announcements of the leading producers and selling interests. There has also been an advance of three points on casing, and line pipe has gone up $4 to $5 a ton, effective the beginning of this week.

Scrap Does Little

Markets in Various Cities Are Either Firm or Uncertain

Philadelphia, March 6.—Eastern Pennsylvania iron mills have been coming out more actively for scrap supplies and have bid up further prices in the grades they require. No. 1 railroad wrought has been the leader in the movement and owing to its scarcity has advanced sharply. Sales were made during the week at $29, delivered, and $30 is said to be obtainable. This is an advance of $2 to $2.50 over a week ago. Buyers of other scrap classifications are more active and the market is responding with higher prices. In heavy melting steel, one eastern Pennsylvania user has paid $23, delivered, for several thousand tons. Other steelmakers are not willing to offer more than $22, delivered.

Scrap Looks Upward

Pittsburgh, March 6.—The market for iron and steel scrap at Pittsburgh has been somewhat excited this week, as a result of strength displayed by the market in adjacent territory. Heavy melting steel is being held at $24 a ton by several dealers at this center. Low phosphorus steel scrap is being quoted at $35, and No. 1 cast scrap has sold at $22.50, or about $1 a ton above the previously prevailing price. Melters in the immediate district have not figured in the market recently, but it is likely that they will open negotiations at an early date, since none of them has heavy tonnages of material in stock.

Buffalo Sales in Small Lots

Buffalo, March 6.—Dealers in the Buffalo district report an improvement in the activity in practically all of the lines, the sales for the most part are made up of small lots aggregating a large tonnage. Disposal of carload lots of heavy melting steel held up on account of the railroad embargoes and congestion as well as other accumulations has caused the price to drop as low as $22.50 and in the past day or so work back to $24. This range at the present time represents the leader of the list. Other lines are holding generally as quoted.

Cleveland Prices Firm

Cleveland, March 5.—The decided relief from traffic congestion reported from the east is not so evident in this territory; there is a little improvement here and there, but the general situation is but very little better. And Cleveland is not unlike most other scrap dealing centers in that its dealing is vitally affected by the transportation situation. The long expected buying movement, which had already been begun in the east, can be held off further by rough weather.

Despite inactivity as to trading, the scrap market is firm; slight advances are recorded almost all along the line except in the case of steel axles, which now are quoted at $43.50 to $44, with few takers at reductions in the last week totaling about $5 a ton.

The principal demand is for No. 1 machine cast, which is quoted at $18.25 to $18.50. Heavy melting steel is rather dull at $22.75 to $23.25, but there is no sign of softening.

Chicago Scrap Stationary

Chicago, March 6.—The Chicago scrap iron and steel market is marking time, with comparatively little tonnage movement. Most consumers have large reserve stocks, and feel this is the time to use that material and buy later when more is needed.

Quotations remain practically unchanged and the general sentiment of dealers is that a higher level will be reached during the spring. This feeling is sufficiently strong that many brokers are not anxious to sell their holding and are waiting for a better price.

Railroad offerings are improving somewhat, although this class of material is not coming out in as large quantities as usual. The Great Northern railroad offers 3,900 tons, the Chicago & Northwestern 3,500 tons, the Mobile & Ohio railroad 1,280 tons, the Kansas City Southern 60 tons.

Scrap Still Uncertain

Cincinnati, March 6.—The iron and steel scrap market is in an uncertain condition because of inability of dealers to complete transactions. Railroad equipment can seldom be had, and when it is available, railroad embargoes make it impossible to deliver to consuming centers in northeastern Ohio and western Pennsylvania. Prices are strong, but are unchanged since last week. Heavy melting scrap continues to be quoted from $19.50 to $21 a gross ton, machine shop turnings from $9 to $9.50 a gross ton, and No. 1 machine cast from $16 to $16.50 a net ton, all Cincinnati basis.

Want Relaying Rails

St. Louis, March 3.—While the past week developed no price change worthy of note in the scrap steel and iron market, the situation continues very unsettled. The cross currents of international politics tend to create nervousness, and neither side apparently wishes to press matters. Purchases by consumers have been moderately heavy only, and this is due in large measure to delays in deliveries of scrap on outstanding orders. Relaying rails, especially the heavier sections, are in excellent demand, with the supply extremely light.

This especial branch of the trade, according to a leading St. Louis dealer, is being stimulated by the railroad track congestion which calls for additional sidings and spurs. The railroads positively refuse to enter the rail market at present levels for siding rails, and furthermore were they willing to meet quotations, could not get deliveries in time to relieve pressure for additional storage track space. The result has been an abnormal demand for second hand rails for relaying.

Railroad congestion and embargoes are enormously hampering deliveries, so much so, in fact, that consumers who have contracted for large tonnages have been compelled to dig deeply into their yard reserves. Unless the situation is quickly relieved, serious consequences are likely to result.

The Texas & Pacific railroad has offered 850 tons of scrap for sale and the Pennsylvania railroad has issued a list of 800 tons.

Scrap Users Ask Concessions

Birmingham, Ala., March 6.—Scrap iron and steel dealers are still looking forward to a material improvement of their business, in the face of an unprecedented pig iron trade. Scrap quotations show little change in the last several weeks. Some of the larger consumers of old material are asking for concessions even on the prevailing prices. There appears to be plenty of stock in the hands of the dealers. Dismantling the 12-story steel frame for what was to have been known as the Roden hotel, Birmingham, will bring onto the market considerable steel scrap, as much of the material cannot be used otherwise. The American Bridge Co. bought in the frame at a sale months ago following litigation. The removing of the frame is being accomplished at a much quicker pace than it was put up.

Buy More Vigorously

New York, March 6.—Consumers of scrap are taking hold more vigorously and the market is developing much strength. The foundries in this vicinity are inquiring actively for grades suitable to their use. It is an interesting commentary on the high prices now ruling in pig iron that some shops which used new metal exclusively in their mixtures are seeking lots of heavy cast scrap to test out this material for their purposes. There is a good demand for wrought material.

(*For complete prices see page* 600.)

Pennsy Lines Buys Rails

Four Mills Have Booked 68,000 Tons Which is Third of Original Tonnage Required—Domestic Car Trade Quiet

New York, March 6.—Reappearance in the market of the Pennsylvania railroad for a portion of its 1918 rail requirements, has resulted in the distribution of about 68,000 tons of 100 and 130-pound rails, one-third of the original inquiry for 205,000 tons, which was withdrawn some weeks ago. The awards have been made to the different mills in the usual proportions of the past. The Steel Corporation received 44 per cent or about 30,000 tons; the Cambria Steel Co. 22 per cent, or about 15,000 tons; the Bethlehem Steel Corporation, 28 per cent, which includes the old Pennsylvania Steel Co. portion, or about 19,000 tons, and the Lackawanna Steel Co., 6 per cent, or about 4,000 tons. These orders are being accepted at the regular price of $40, mill, for open hearth.

No further awards of the heavy rail tonnage for the French government, which has been active before the mills have been made. The makers are submitting to the buyer the tonnage they can deliver by the end of next year. A very heavy quantity may be taken. A 2,000 to 3,000-ton light rail inquiry for Java is open.

It now is announced that the portion of the large French car order taken by the Standard Steel Car Co. amounts to 10,000 to 12,000 cars. This order originally was reported as 5,000 cars. Most of the cars are to be of the small 4-wheel type and will be erected by the company in its own shops which it has provided in France. Other builders are figuring on the remainder of these cars. A representative of a Barcelona, Spain, industrial works is in the country taking figures on 2,900 freight cars of different types. These are the same cars covered by previously reported Spanish inquiries. The domestic car market continues quiet. The Pere Marquette has ordered 1,000 box cars of the Haskell & Barker Car Co. The Florida East Coast wants 200 flats and 100 box and the New Haven 175 refrigerators.

Locomotive buying goes on steadily. The Union Pacific has awarded 68 to the Baldwin Locomotive Works and 16 to the American Locomotive Co. The Lehigh Valley placed 56 with Baldwin, and the Rock Island 30 with the American works.

Locomotive builders are now figuring on an inquiry from the Chicago & North-Western railroad for 120 locomotives. The Southern Pacific railroad is said to have placed 40 locomotives with the American and Baldwin companies.

Light Rails Up $5

Pittsburgh, March 6.—The Carnegie Steel Co. and other manufacturers of light rails advanced prices $5 a ton March 6, and now are quoting 25 to 45-pound sections at $55. Demand for light rails is heavy. Traction line interests and mine owners are negotiating for rather heavy tonnages for emergency work.

Standard railroad spikes are being firmly held at 3.40c as the minimum, with some makers asking 3.50c. No change is noted in prices of other track fastenings.

Car Buying Slow

Chicago, March 6.—Activity in the buying of railroad freight cars continues slack, and comparatively few have been placed, while inquiry is not large. The Consolidation Coal Co. has placed 300 hoppers with the Pullman Co. The Florida Eastern Coast railroad is inquiring for 200 steel flat cars and 100 fruit cars. The Great Northern railroad is inquiring for 250 steel gondolas. The Milwaukee Electric railroad is inquiring for 200 general service cars. The Chicago, Milwaukee & St. Paul railroad has asked prices on 200 flat cars and 200 refrigerators.

Rail Buying Light

Chicago, March 6.—Buying of standard steel rails continues to be light and sales in western territory have been in small lots. It has been reported that the Pennsylvania railroad has closed for 75,000 tons which has not yet been divided between eastern and western mills. The inquiry by the United States government for the Alaska railroad is still pending.

Light rails have been advanced $5 a ton, and are now quoted at $52, Chicago mill, for 25 to 45-pound sections. Lighter weights are held at the usual differentials.

No large inquiries or sales of track fastenings have been made, but continuous buying is being done, and a fair tonnage results.

Canadian Lines Buy

Toronto, March 6.—The rolling stock of the Intercolonial Railway is being largely increased by the Canadian railway department. Since the beginning of the year the Canadian Locomotive Works of Kingston has filled orders for 30 heavy mikado freight locomotives and has been awarded contracts for 20 more of the same type, the price being about $39,000 each. In addition to these, the department recently purchased ten Santa Fe moguls at $36,486 each, delivered at Montreal in bond, and has also secured 28 second-hand engines from Transcontinental Railway contractors.

(*For complete prices see page* 600.)

Coke Price Drops

Production Increases for the Week in Connellsville

Pittsburgh, March 6.—The heavy fall of snow in western Pennsylvania on Sunday apparently has not retarded shipments of Connellsville coke. Shippers say the car supply this week is about 10 per cent better than it was 10 days ago. Blast furnace managers are not complaining about deferred deliveries of fuel. Spot furnace coke today was offered at $10.25 a ton at the ovens, or $2.25 a ton less than the price prevailing a fortnight ago. The market for contract delivery is quiet. Seventy-two hour coke is selling at $12.50 to $13.00 for spot shipment, and from $7 to $7.50 for delivery after July 1, next. Many consumers have covered foundry coke requirements for the year ending July 1, 1918. *The Connellsville Courier*, for the week ending Feb. 24, says production was 353,461 tons, compared with 306,624 tons the week before.

Wants Foundry Coke

New York, March 6.—Inquiries for from 7,040 to 14,080 tons of 72-hour coke, and from 3,880 to 7,760 tons of core oven coke, have been issued by the Worthington Pump & Machinery Corporation for its various plants. The range in the amounts depends upon whether the fuel is bought for six or twelve months, beginning July 1.

Last half by-product coke recently closed by the New England maker with the plants in that territory are estimated at about 75,000 tons. These sales were made at approximately $10 and slightly higher, delivered, equivalent to $6.50, Connellsville. This coke for spot delivery commanded from $14 to $16, delivered. This maker now has withdrawn all prices. Many plants in New England and vicinity were helped out of difficulties by this local coke during the recent freight congestion.

The building occupied by the Pittsburgh Testing Laboratory, Pittsburgh, was damaged slightly by fire recently.

Pig Iron Output Declines Sharply

February Production of Coke and Anthracite Pig Iron is Less Than in Any Month Since September, 1915—Traffic Congestion Curtailed Output But Conditions Are Improving

The decline in pig iron production, which began in November and continued through December and January, was more pronounced in February than in any of the three preceding months. The production of coke and anthracite pig iron in February reached a total of only 2,653,035 tons, this being the first month since September, 1915, to fall below the three million mark. As conditions contributing to this decline, such as the traffic congestion and coke shortage, are slowly improving, March

AVERAGE DAILY PRODUCTION.

	1917.	1916.	1915.	1914.	1913.
Jan.	101,930	102,319	51,323	60,624	89,929
Feb.	94,751	106,157	59,521	67,450	92,095
Mar.		107,343	66,009	75,534	89,123
Apr.		107,517	70,484	75,383	91,812
May		108,535	72,747	67,646	90,865
June		107,127	78,998	63,486	87,229
July		103,907	82,687	63,075	82,525
Aug.		103,156	89,510	64,403	81,839
Sept.		106,935	94,478	62,757	83,137
Oct.		113,167	100,656	57,007	81,933
Nov.		110,593	101,174	50,042	74,322
Dec.		102,715	103,278	48,236	63,746
Av'ge	98,523	106,610	81,022	62,934	83,980

should make a better record than any of the past four months.

Pig iron production for February showed a decline of 506,804 tons compared with January, when 3,159,839 tons were produced. This is due in part, of course, to the fact that February had only 28 days. A comparison of the daily averages, however, shows a loss of 7,179 tons last month, the daily average for January being 101,930 tons and for February, 94,751 tons. The February daily average is also the lowest since September, 1915.

The output of the steel works or non-merchant furnaces in February amounted to 1,889,156 tons, compared with 2,297,394 tons in January, a loss of 408,238 tons. Merchant furnaces show a loss of 88,811 tons in the total production, the February tonnage being 731,063, compared with 819,874 in January. The daily average output of steel works furnaces in February was 67,470 tons, a loss of 6,639 tons compared with the January daily average of 74,109 tons. Merchant furnaces showed a decline of only 339 tons in their daily average last month, the February daily average being 26,109 tons, and that for January, 26,448 tons.

Spiegel and ferro production also showed a decrease. The spiegel output in February amounted to 9,744 tons, compared with 14,096 tons in January, a loss of 4,352 tons. The decrease in ferro production amounted to 5,403 tons, the figures for January and February being 28,475 tons and 23,072 tons, respectively.

Nine merchant furnaces were blown in during the month, while three merchant stacks were blown out, making a net gain of six. Seven additional steel works furnaces were put in blast and six were taken off the active list, making a net gain of one.

Forty-five members of the senior engineering class of the Ohio Northern University inspected several industrial plants at Pittsburgh last week.

Hubbard & Co., Pittsburgh, are negotiating for a portable motor driven shear, 440-volt, 3-phase, 60-cycle, alternating current.

Wire Goes Higher

Brings All Products to Highest Point in 25 Years

Pittsburgh, March 6.—The long expected advance in prices of wire products was made at the close of business last Saturday by the American Steel & Wire Co., which put up quotations $4 a ton all along the line, effective March 5. Prevailing prices of all wire products, except nails, are the highest reported in the history of the trade. Nails today are quoted at $3.20 a keg, the price adopted Dec. 30, 1899, at which time John W. Gates was an important factor in the wire trade. On March 21, 1900, however, prices of wire products declined $20 a ton.

MONTHLY PRODUCTION.

	1917.	1916.	1915.
Jan.	3,159,839	3,171,878	1,591,024
Feb.	2,653,035	3,078,548	1,666,592
Total 2 mos.	5,812,874	6,250,426	3,257,616
Mar.	.....	3,327,630	2,046,280
Apr.	.....	3,225,496	2,114,518
May	.....	3,364,584	2,255,157
June	.....	3,213,818	2,369,932
Total 1st half.	.....	19,381,954	12,043,503
July	.....	3,221,127	2,563,311
Aug.	.....	3,197,838	2,774,825
Sep.	.....	3,208,041	2,834,342
Oct.	.....	3,508,180	3,120,340
Nov.	.....	3,317,805	3,035,235
Dec.	.....	3,184,178	3,201,605
Total 2d half	.....	19,637,169	17,529,658
Grand total	5,812,874	39,019,123	29,573,161

Prevailing prices are as follows: Nails, $3.20 a keg; polished staples, $3.35; galvanized staples, $4.05; painted barb wire, $3.35; galvanized barb wire, $4.05; annealed fence wire, $3.15; galvanized fence wire, $3.85, per 100 pounds to jobbers. Wire fencing is quoted at 51 per cent off the list, or two points above the previously prevailing quotation. Cement-coated nails are listed at $3.10 a keg to jobbers.

During the last 12 months, prices of wire products have advanced $16 a ton. Three advances of $2 a ton each were made on May 1, Aug. 7 and Oct. 18, 1916; two advances of $3 a ton each were made on Nov. 4 and Nov. 24, 1916. Wire products have advanced $24 a ton since July 20, 1914, and it is likely that further advances in price will be announced at an early date. The advance was the sharpest made in almost 20 years.

FEBRUARY PIG IRON

States.	No. of stacks.	No. in blast last day of month. Feb.	Jan.	Total tonnage made. Merchant.	Non-Merchant.	—Total:— Feb.	Jan.
Pennsylvania	155	125	121	207,146	848,947	1,056,093	1,264,526
Ohio	77	66	65	150,528	433,759	584,287	686,335
Alabama	45	31	30	138,137	84,065	222,202	249,805
Virginia	22	8	8	28,987	.....	28,987	34,445
New York	26	17	15	56,066	77,071	133,137	160,779
New Jersey	6	1	1	5,765	.....	5,765	6,347
Illinois	24	22	24	44,791	214,184	258,975	312,858
Colorado	6	4	3				
Indiana	10	9	10	27,350	185,865	213,215	261,655
Maryland	4	4	4				
Wisconsin	6	5	5				
Kentucky	7	4	4				
West Virginia	4	4	4	46,233	23,689	69,922	79,753
Tennessee	17	11	10				
Washington	1	0	0				
Georgia	2	0	0				
Texas	3	0	0				
Minnesota	3	3	3	26,060	21,576	47,636	58,765
Michigan	3	2	2				
Missouri	1	1	1				
Spiegel—All states...						9,744	14,096
Ferro—All states.....						23,072	28,475
Totals	422	317	310	731,063	1,889,156	2,653,035	3,159,839

Corporation Files Brief in Great Suit

Cogent Reasons Advanced Why Appeal of Government in Dissolution Case Should Not Be Allowed by Supreme Court—No Intent to Monopolize or Endeavor to do so Has Been Shown

THE brief of the United States Steel Corporation in reply to the government brief in the "dissolution suit" was filed with the Supreme Court at Washington, last Saturday. Formal argument of the final appeal in this long drawn out suit will be made shortly.

The brief of the Steel Corporation makes a volume of 369 pages, the formal statement of the case accompanying this brief making another book of 623 pages. In these two volumes are stated succinctly the reasons why the great Corporation should not be dissolved and why the appeal of the government from the decision of the four federal circuit court judges who found for the Steel Corporation should be dismissed. The government's 23 assignments of error in the finding of the lower court are taken up separately in the Steel Corporation brief. In dealing with the questions arising out of the organization of the various subsidiaries of the Corporation, the brief of the Corporation's attorneys declares it unnecessary to examine individually the circumstances leading to the formation and conduct of each subsidiary for these reasons:

"1st. Because the question to be determined in this case is not whether these companies monopolized trade 15 years ago, but whether, under the control of the Steel Corporation or otherwise, they monopolized it or restrained it, or threatened to monopolize or restrain it, at the time the petition was filed, and we think we have successfully shown that they did not do this.

"2nd. Because the petition does not allege and the proofs do not show that any one of the subsidiary companies was organized with a view to combining with any of the others or as a step or act in furtherance of the creation of the Steel Corporation. Indeed, it affirmatively appears that the organization of the Steel Corporation was not conceived until long after the last of the subsidiaries was organized and had begun active business.

"3rd. Because it is established by U. S. vs. Reading Co. that a court of equity will not, in a proceeding for injunction under the anti-trust act, either determine or consider the validity of independent and unrelated organizations alleged to be in violation of such act, notwithstanding they later become parties to a general combination also alleged to be in violation of the act, and notwithstanding objection on the ground of multifariousness or misjoinder is not taken in the answer and is first made at a final hearing.

"It is impossible, we think, to distinguish the present case from the Reading case in this particular and we, therefore, respectfully submit that we are not called upon to further defend against the charge of illegality in the organization of these subsidiaries or against the demand for their dissolution."

After reviewing at length the several acts of the Steel Corporation since its organization, the brief draws the following conclusions from the course of conduct followed by the Corporation since its foundation:

"We have now reviewed the evidence bearing on the policy and practices of the Steel Corporation from the time it began business on April 1, 1901, to the close of the testimony on March 30, 1914, a period of exactly 13 years.

Worked Out Economies

"We have shown that throughout its whole career the Corporation has pursued with vigor and success the objects declared by its founders at the time of its formation; that it has decreased the cost of production, increased wages, decreased prices, and greatly extended trade in steel products both at home and abroad; that its treatment of both competitors and consumers has been fair and just; that it has neither attempted to oppress the one or to coerce the other; that the few plants which it has purchased were offered to it, and that, with a single exception, they were purchased because, and only because, they were needed in the development of the Corporation's business; that this exception was the plant of the Tennessee company, and that this was purchased with the approval of the government for the purpose of preventing the spread of a most dangerous financial panic.

"We have shown that instead of promoting pools and combinations, the Corporation destroyed them and destroyed them, so far as they were known to it, as early as 1904; that although the manufacturers met together from time to time after the breaking up of the pools, they went no further at their meetings than to mutually exchange information and make declarations of purpose which the petition admits they had a lawful right to do; that the Gary dinner movement amounted to nothing more than an endeavor to prevent reckless price-cutting and general demoralization at a time of great industrial peril, and that this was sought to be accomplished simply by an appeal to reason and the establishment of a relation of mutual respect and confidence, by which it was hoped to secure open and fair dealing and prevent the misunderstandings out of which nearly all the trade wars of the past had grown.

"We have shown that instead of monopolizing the manufacture of steel, the Corporation's percentage of the country's production has steadily decreased; that instead of monopolizing the supply of ore, the Corporation has confined its purchases to two or three localities and that in the locality where its holdings are largest—the Lake Superior district—it has relatively less than many of its competitors and less than its own experts and the experts of its competitors testify that it ought to have.

"We respectfully submit that by this record the Corporation has proved the bona fides of the claim made for it at the time of its organization, that its purpose was the development of a great business along legitimate and permissible lines, and not the monopoly or restraint of trade.

"We have heretofore argued that neither the Corporation's purchase of its subsidiaries, nor the circumstances surrounding its organization raised a presumption of intent to monopolize or to restrain trade, but that, on the contrary, they indicated a purpose to develop and extend trade, and that the slight extent to which competition was suppressed by such organization was but indirect and incidental to such lawful purpose.

"If, however, the circumstances surrounding the organization left the matter of intent in doubt to be established by the after-conduct of the parties, we now have such after-conduct extending over the long period of 13 years, and we submit that it completely rebuts any presumption (if any there was) of intent to restrain trade or to acquire a monopoly, and as completely establishes the contrary intent."

Recalling the various government investigations of the Steel Corporation from 1898 to 1907 through committees of congress and the bureau of corporations, the brief says:

"It does not appear that either investigation disclosed any illegality in the organization of any of the companies or of the Steel Corporation, and any purpose or intent to restrain trade or to monopolize the same either at the time of such organizations or afterwards. * * * It is not necessary to claim that these circumstances worked an estoppel against the government but we do claim that they indicate a contemporaneous judgment in favor of the integrity of the organization and management of the Steel Corporation by those whose duty it was to judge, and that such judgment ought not to be overturned at this late date after rights of so important a character have grown up in reliance upon it except for the most cogent and persuasive reasons."

Keen Iron Maker

Death of Edgar S. Cook, for Years With Warwick

Edgar S. Cook, president of the Warwick Iron & Steel Co., and for many years one of the leading pig iron men of the east, died unexpectedly March 4 at Redlands, Calif., where recently he had made his winter home. His death was due to acute indigestion.

Edgar S. Cook was born in Philadelphia, Aug. 28, 1851, his father being Jesse M. Cook, his mother, Sarah Scudder Cook. The ancestors on his father's side were of English origin, settling in Rhode Island about 1640, moving from there to Long Island, and later to New Jersey, in the neighborhood of Princeton and Trenton. On his mother's side the antecedents trace to the colonial period of Massachusetts.

Edgar S. Cook obtained his education at the Central high school of Philadelphia, and graduated in 1869 at the head of his class. His first occupation was as clerk in the coal office of Cain, Hacker & Cook, miners and shippers of Schuylkill county anthracite coal, Berks county, Pa., which was owned and operated by Wright, Cook & Co., manufacturer of pig iron. Mr. Cook became business manager of the works in 1873. In November, 1877, he accepted the management of the furnace of the Warwick Iron Co., at Pottstown, Pa., and became the president of that company in February, 1900. He organized the Warwick Iron & Steel Co. in June, 1899, and increased the capacity of the plant, serving many years as president and general manager. In 1912 the Warwick furnaces were leased to the Eastern Steel Co. and Mr. Cook retired from active management. Mr. Cook was a member of the American Institute of Mining Engineers since 1877, and the American Society for testing materials since 1902. He was married Jan. 2, 1879, at Pottstown, Pa., to Josephine Bailey, and had four children, one of whom, E. B. Cook, is with the blast furnace department of Pickands, Mather & Co., Cleveland. Mr. Cook was a very progressive iron man and followed the most advanced practices in his plants.

Machine Company Grows

The National Machine Co., Hartford, Conn., has voted to increase its capital stock from $60,000 to $100,000, to provide for extensive alterations. It has elected the following officers for the ensuing year: S. M. Weatherly, president; Edward D. Redfield, vice president; William F. Loomis, secretary and treasurer; F. J. Palmer, assistant secretary; S. M. Weatherly, Edward D. Redfield, William F. Loomis, H. J. Stach, Fred C. Billings, Silas Chapman Jr., and Horace H. Ensworth, directors.

Closing Up Deal

Jones & Laughlin and Inland Steel Take Ore Leases

The Jones & Laughlin Steel Co., Pittsburgh, and the Inland Steel Co., Chicago, are closing negotiations for the lease of two large iron ore properties in northern Minnesota, owned by the Great Northern Iron Ore Properties. While reports of the

EDGAR S. COOK

transaction could not be confirmed at Pittsburgh, yet it is known that the Jones & Laughlin Steel Co. for some time has been considering the lease of additional iron ore mines in the Mesabi range.

According to a dispatch from St. Paul, Minn., the lease of the Jones & Laughlin company involves $70,000,000, and that of the Inland company is said to involve $40,000,000. Payment is based upon the amount of ore produced, with a yearly minimum specified, and the leases, it is said, are to run until the ore is exhausted.

The Jones & Laughlin company now owns a number of mines on the Mesabi range in the Lake Superior iron ore region. The company also owns mines in the Marquette and Gogebic ranges, the combined annual output of which is 1,800,000 tons. Officers of the company would not confirm the report about the new lease.

Iron May Rise

Heavy Demand Features Market at Pittsburgh

Pittsburgh, March 7. (By wire.)—Rather heavy demand features the pig iron market and indications are that prices will be advanced $1 or $2 a ton at an early date. No. 3 foundry iron has sold at as high as $35, valley, and No. 2 foundry is commanding $38, valley. Some dealers are asking $40, valley, for bessemer iron. The market for basic iron reflects strength. It develops that fairly heavy tonnages of steel works basic iron found their way to the open market during parts of January and February, while many finishing mills were compelled to shut down on account of shortage of gas and coal. This tonnage, it is understood, has been absorbed and dealers believe the price of basic iron soon will resume its march toward higher levels.

The Connellsville coke market is quiet but prices show no important change in position. Some dealers are asking $11, ovens, for spot furnace coke.

Iron Inquiry Good

Domestic and Foreign Inquiry Out in East.

New York, March 7. (By wire.)—A Bridgeport, Conn., steelmaker is inquiring for 3,000 tons of basic pig iron for second half year delivery. A central Pennsylvania furnace again has advanced his quotation $1 a ton to $34, furnace. The sale of about 1,000 tons of foundry iron by a western Pennsylvania maker to a buyer in this territory for the first half of 1918 is reported. Italy has put out a new inquiry today for 1,500 tons of bessemer, 1,500 tons of Alabama No. 2 soft, and 1,000 tons of 12 to 13 per cent ferro-silicon.

Confirmation is given out here by the trustees of the Great Northern Ore Properties that important leases have been made but the details must come from St. Paul. Newspaper reports here state Inland Steel and Jones & Laughlin Steel Co. have taken these leases.

Hoop and Band Prices

Pittsburgh, March 6.—The Carnegie Steel Co. is quoting hoops and bands only upon application, although the company has made no formal change in prices since the adoption of the 3.50c price of hoops and the 3c price of bands.

Steel Ingot Production

In February Compares Favorably With January Although Pig Iron Output Declines Sharply

The steel mills of the country suffered less from the acute traffic congestion in February than did the blast furnaces. This condition is revealed by a comparison of the pig iron production of all of the blast furnaces, given on page 565, with the steel ingot production of 25 per cent of the independent steel companies, given in the accompanying table.

The blast furnaces produced 2,653,035 tons of pig iron in February compared with 3,159,839 tons in January. The decline of 506,804 tons does not fairly represent the comparative furnace activities in the two months, as February had fewer days. Putting the output into terms of average daily production, the furnaces produced 94,751 tons daily in February and 101,930 tons daily in January. The loss of 7,179 tons represents a decrease in February of a little more than 7 per cent.

The independent steel companies, which have given *The Iron Trade Review* the records of their January and February output of open-hearth, bessemer and electric steel, produced 388,477 tons of steel in February against 436,950 tons in January. The decline in February was thus 48,473 tons. On the basis of average daily production, these companies produced 14,095 tons daily in January and 13,874 tons daily in February, a loss last month of only 221 tons, or about 1.6 per cent.

Steel Ingot Output

FIGURES SUPPLIED BY 25 PER CENT OF INDEPENDENTS.

	Feb., 1917.	Jan., 1917.
Basic and acid open-hearth ingots.....	318,925	358,742
Bessemer ingots.....	67,310	75,150
Elec. furnace ingots..	2,242	3,058
Totals	388,477	436,950

Transportation Vs. Production

The greater curtailment of blast furnace operations resulted largely from the necessity of transporting the raw materials for longer distances than in the case of the materials entering the steel furnaces.

This condition was true particularly of coke with which few blast furnace plants were fully supplied. The consequent banking and irregular operation of a number of stacks cut down the pig iron output. Sufficient supplies of raw materials for the steel furnaces, on the other hand, were generally in the plants, permitting operations to be maintained near capacity.

Decides to Retire

I. Rothstein, Eau Claire, Wis., is about to dispose of the waste material business which he established more than 40 years ago. Due to the recent death of Joseph Kumferman, for more than 38 years manager of the business, and to the fact that Mr. Rothstein is in ill health, the latter has decided to retire.

More Ore on Dock

Cleveland, March 6.—The docks at lower lake ports are now holding much more ore than they were 12 months ago. The balance on Lake Erie docks on March 1 was 8,449,839 tons against 6,213,739 tons on March 1, 1917. Shipments to interior furnaces last month were 680,759 tons against 680,266 tons in February, 1916. The ore is now moving more freely, but it is evident that when the navigation season opens the, docks will not be as bare as they were a year ago.

Shafting Market Active

Pittsburgh, March 6.—Several orders for cold rolled steel shafting for emergency purposes have been placed by concerns believed to be furnishing finished material for the government. Shafting generally is quoted at 15 per cent off the list, although the 20 per cent off the list price has not disappeared. Shipments are deferred from 90 days to six months.

The Non-Ferrous Metals

Copper **Lead** **Spelter** **Tin**

New York, March 6.—The metals markets in general continue to reflect a firm tone; during the week tin, lead, spelter and aluminum prices have shown an advancing tendency, while copper and antimony are firm and practically unchanged. There is very little demand, however, and the trade as a whole is not inclined to expect much activity until the present uncertainty with respect to our foreign policy, at least over the immediate future, is removed. The present market strength, however, continues to be based in a large measure on the expectation that it is only a question of time before the United States enters the war.

The situation in the copper market shows very little change. The metal is exceedingly scarce for all deliveries over the first half, but the lack of demand has led some sellers to do business at slightly lower prices for prompt and nearby shipment. Electrolytic now may be quoted at the following level: Prompt and March shipment, 36.50c to 36.75c, cash, New York; April, 35.50c; May, 34.50c; June, 33.50c; third quarter, 31.50c to 32c. Prime lake copper may be quoted at 35.50c to 36.25c, cash, for prompt and March shipment, while casting copper is obtainable at around 33.25c, cash, for prompt and March shipment.

The lead market now is sold ahead farther than ever before in its history, and there is very little lead left for March and April shipment. Demand has shown an improvement and there have been inquiries of late for deliveries as far ahead as August. Spot lead in New York now is quoted at 10.25c, New York. March shipment from St. Louis, is quoted at 9.62½c to 9.75c, St. Louis, and in some cases 9.87½c and 10c have been asked. April shipment has been sold at 9.25c, St. Louis, and 9.37½c has been asked on this position.

Demand for aluminum has improved; some good orders for export particularly have been booked or are pending. The supply of the metal again shows a shrinkage, so that prices are being affected. Prompt carloads now may be quoted about as follows: No. 1 virgin 59c to 62c; No. 1 remelted 55c to 58c; No. 12 remelted 39c to 42c. The domestic producer of late has been booking contracts through 1918 at 37c for No. 1 virgin.

Spelter has followed an uneventful course during the week. Demand has been of slender proportions, but producers are firmer in their price views, due partly to the high ore prices now prevailing. Prime western may be quoted as follows: Spot, 11.50c to 11.75c, New York; prompt and March shipment, 10.62½c to 10.75c, St. Louis; April, 10.37½c; second quarter, 10c. The premium on brass special spelter has shrunk slightly and prompt brass special now may be quoted at 11.50c to 11.75c, St. Louis.

The antimony market is quiet but firm. Spot Chinese and Japanese is quoted at 31c to 32c, duty paid, while some spot domestic is offered at 33c. February shipment from the Orient, to arrive in April, has been sold at 20.50c, in bond. March shipment is quoted at about 15c to 15.75c, in bond, and April shipment at 14.75c to 15c.

Practically the only tin now being offered for sale is spot and distant futures, since the British policy of withholding information as to movements of vessels prevents importers from knowing when to expect shipments and hence they cannot offer nearby arrivals as formerly. A good business in spot Straits was transacted today at 54.25c, New York, and later some spot material was sold at 54.50c, which now appears to be spot market. May and June shipments from the Straits are being offered at 47.50c, but none has been sold at this level. Spot Banka is holding nominally at 53c, New York.

(*For complete prices see page* 600.)

Fig. 1—Attractive Homes of Workmen of the Schneider Plants—The Company Assists its Employes in Financing and Building Their Homes

Welfare Work at "L'Etablissement Schneider"

The Management of the Largest Manufacturing Concern in France Does Not Confine Its Attention to the Welfare of Its Workmen, But Extends Its Helpful Influence to Members of Their Families

WHEN we hear the name of France spoken today we immediately visualize an immense battlefield with all the attendant horrors of war. Back of the battlefield stand the steel plants working ceaselessly to turn out munitions so that the god of war may not be forced to cease his operations. As this is not a pleasant picture, it is with relief that we look back to the time before the war when the steel mills, then the centers of peaceful industrial communities, were occupied with benevolent schemes for preserving life, instead of, as at present, busy devising more and more deadly means of destroying it.

Welfare work has, in recent years, taken a more and more prominent place in the factories and shops in this country. The day when the workman was the tool upon which the manufacturer bestowed the least thought has faded so far into the background of our minds that we are startled when we run across an employer who still considers that overwork and daily risk are natural and just conditions to which the laborer should submit without complaint. That such men do exist proves, however, that although our work for the comfort and safety of our men has reached an advanced state is because of the speed with which we have moved, not because we have labored towards that end through many years. It is, therefore, with surprise that we, leaders in so many movements, hear of the work which had been done in the European countries before we had dreamed of attempting similar welfare work.

The Schneider brothers, operating "Les Etablissements Schneider", the largest steel plants in France, have for over half a century taken a personal interest in their employes, and for years have had a wonderfully effective welfare system in operation. Their interest is not confined to the well-being of their workmen only, but they are equally concerned with the health and happiness of the wives and children of their employes.

Caring for Employes' Children

Because the mortality among infants is so much greater during the first year of life than at any later period of development they try to see that the conditions surrounding the child during that first year are as advantageous as possible. This object is attained by various means, the most important ones, according to the book published by the Schneider firm on the social economy of the Schneider works, follow: First they have sought to develop among their employes habits of thrift and temperance, so that the parents of the new generation may be strong and healthy. In addition they have made it their business as far as possible to see that the homes of their workingmen are hygienically fit. And finally, they endeavor to make the salaries of their men large enough so that the mother of the family can stay in the home and give the children proper care. This is considered the most effective means of all, and the combination of efforts has worked so well that the town of Creusot, which logically, as a crowded industrial center, should have a high death rate among its infant population, has a smaller one than the entire agricultural department of Saone-et-Loire, in which it is located. During the four years from 1907 to 1910 the rate of infant mortality was 7.40 per cent for Creusot, while it was 10 per cent for the entire department.

Children who are so unfortunate as to be orphaned of either one or both parents are taken care of by an institution, "La Maison de Famille," founded and supported by the Schneider company. The whole idea of this institution is worked out with the utmost care for detail. The child who has neither parent living is cared for entirely at "La Maison de Famille", but the one who has one parent living who is able to help take care of it, spends only its days at "La Maison de Famille" and

FIG. 2—WELL-BUILT HOME OF A SCHNEIDER EMPLOYE

FIG. 3—WORKMEN TAKE PRIDE IN OWNING A HOME LIKE THIS

FIG. 4—SONS OF STEEL PLANT WORKMEN AT A SCHNEIDER SCHOOL

is taken home at night. The institution feeds it, but the parent clothes it. In case the surviving parent is, for some recognized reason, unable to take any part in the child's support, the institution accepts the burden of its support entirely, but at no time does it attempt to cut the child completely off from association with the parent on this account. The parent has free access to the institution to visit the child, or the child can spend the week ends with the parent and at any time that improved conditions warrant it, the parent can remove the child to his home. Because the mothers who have little children at "La Maison de Famille" generally bring them to the home in the morning as they start out for their day's work, and call for them at night, the institution serves also, in a sense, as a school for mothers, for at these times they incidentally acquire considerable knowledge on the care of children.

The health of the children is the object of special attention, and before their admission they are submitted to a medical examination. The result of the examination determines the treatment they are to receive, and three months of care generally brings about a complete transformation in a sickly child. The children are constantly under the care of a doctor and a sick child is immediately removed to the hospital if its illness proves to be severe.

In 1836, out of a population of 3,117 inhabitants more than 300 children of both sexes at Creusot received no education. Realizing that mental care was in its way as necessary as physical, the Schneiders at this time founded a primary and secondary school for the male children of the employes of the works. They also promised to establish a girls' school at a later date. The general expenses of the school were to be covered partly by a fund provided by the Schneiders and partly by the fees of the pupils. These were made low enough so that they were not a burden to the parents, but merely served to stimulate their interest in the progress made by the children. For pupils who specially distinguished themselves in their work, or for those who were unable to pay the usual amount, the fees were lowered. At first the schools were not well patronized, but gradually the interest became more general and in 1873 the organization attained its present form. In 1912 the school consisted of three elementary groups, consisting of 13 classes with 600 pupils; a preparatory group of four classes with 200 pupils; a special group of 10 classes with 450 pupils; and finally "le cours superieur", which comprises a three-year course of study. Views of classes in these schools are shown in Figs. 4, 5, 6 and 7.

These various classes have an aggregate scholastic population of more than 1,250 pupils. All of the children start in the elementary grades. From there those who show special ability are transferred to the special group where they are given instruction which compares very favorably with our high school course. Special emphasis is given to chemistry and physics, mathematics, design work and mechanics, although the course includes cultural studies as well. Pupils who are not considered eligible to the special group are placed in the preparatory group, where the cultural subjects are given less attention and the vocational training, although not so advanced and complete as that given to the special group, is of the same general description and fits them to enter the works when they complete the course. The position given a boy depends solely on the showing he has made in his theoretical and practical work in the school, and no other consideration has any weight. Naturally the pupils from the special group are given a preference in the matter of positions.

Boys of the special group who prove themselves specially gifted continue their education in the "cours

FIG. 5—EMPLOYES' DAUGHTERS ARE TAUGHT GOOD HOUSEKEEPING

superieur". The three years' work which comprises this course of study is planned by the engineers of the Schneider works who are graduates of the Polytechnic school, the Paris School of Mines, and of other well-known technical schools, and is designed to give to the young people a good scientific and technical training. They are likewise trained in the arrangement, the work, and the complex life of the shops, which they will some day be called upon to direct. Among the studies included in the curriculum are French, elementary mathematics, descriptive geometry, trigonometry, algebra, analytical geometry, mechanics, thermodynamics, physics, chemistry, technology, some of the principles of civil engineering, forge and machine shop work, metallurgy of iron and steel, industrial electricity, industrial design work, English and German. The lower divisions of the course have buildings in three or four different districts of the city, so that no child is forced to go too great a distance. Children whose parents are not employes at the Schneider works are admitted to the Schneider schools on payment of higher admission fees than those required of the children for whom the schools were originally founded. Also there are special age limitations for children coming to the Schneider schools from the municipal schools.

With this kind of school directly attached to the works, so directly that pupils in the special and preparatory groups are called student-workers, and get their practical experience in the shops themselves, it is needless to say that the Schneider company does not have to bother with the apprentice problem. The question of "Where shall we get our skilled workmen?" has not yet appeared on their horizon. Of course this situation applies to the before-the-war conditions. How affairs will be after the war remains to be seen, but if these problems must be solved anew at that time, it will be no fault of the effective system which has been established.

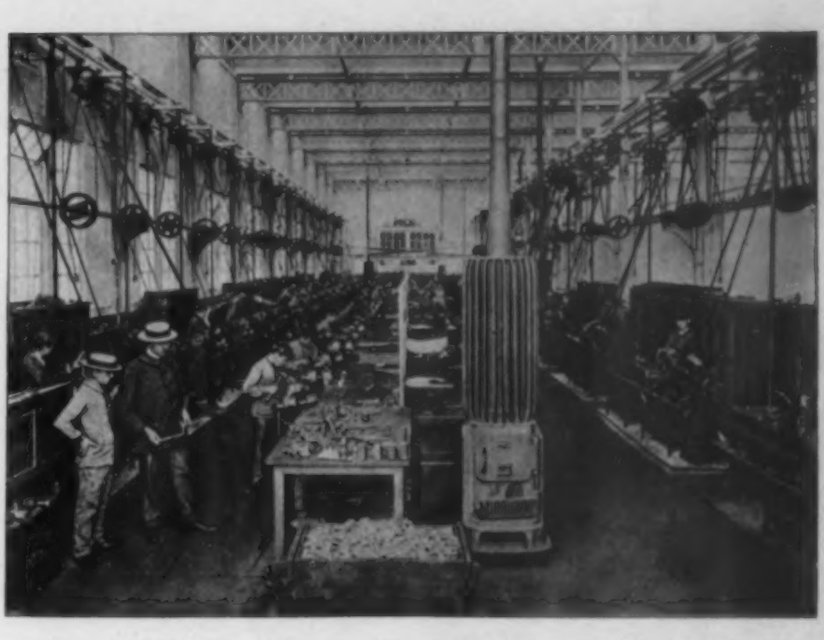


FIG. 7—A WORKSHOP WHERE APPRENTICES GAIN VALUABLE EXPERIENCE

In accordance with their promise, a girls' school was organized shortly after the boys' school was started on its successful career. Here the girls are given a complete course in domestic science so that they may be as successful as home makers as the boys will be as bread winners. After having trained good, efficient workmen, the next move is to make them contented with their life in the shops. In order that there may be no cause of grievance of which the employer is in ignorance, and which may finally result in trouble, the employes of each division of the plant are formed into corporations, each of which elects two delegates to act as intermediaries between the employer and the employes. All workmen who have the franchise and have been on the pay-roll at the last pay day are eligible to vote for delegates. In this way the atmosphere between employe and employer is kept clear and troublesome disputes settled before they become acute.

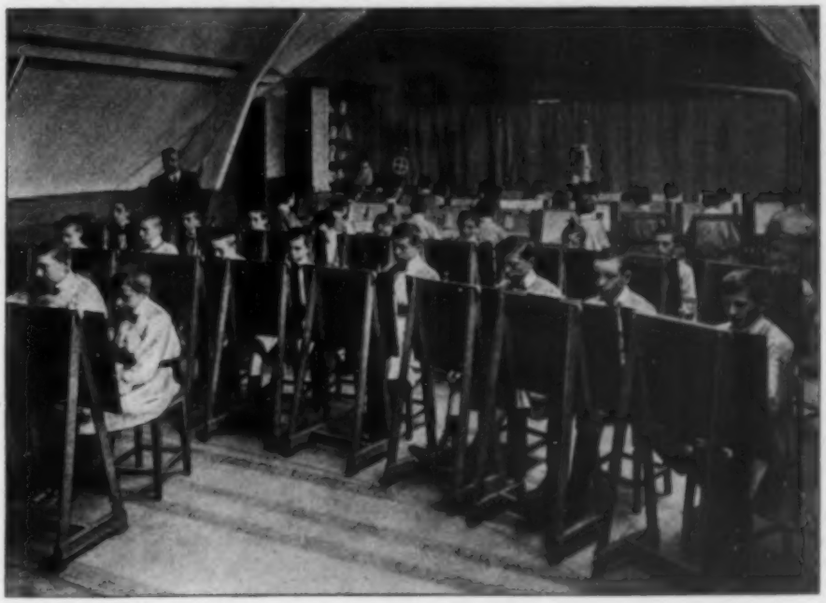


FIG. 6—A CLASS IN DRAWING IN ONE OF THE BOYS SCHOOLS

Particular care has been given to making the buildings hygienic and safe. An inspector has charge of questions concerning accident and fire prevention and it is his duty to see that the buildings are kept as free as possible from these dangers. One protective measure which is considered particularly effective is the painting of all safety guards a bright red. The red attracts the eye, and warns the workman that the guarded object is dangerous and that, although guarded, care is required in the manipulation of it. For the protection of the works, a volunteer organization has been formed among the workmen whose duty is to protect the plant from any danger, inside or out. They are thoroughly trained and drilled so that in time of danger they would prove a valuable aid. That same training has in all probability made them more efficient soldiers during this war.

In connection with the home life of

the people, the Schneider company has adopted for its motto that excellent maxim of Jules Simon, "Without homes there is no family; without family there are no morals; without morals there is no man; without man there is no country." With this in view the Schneiders in 1838 established a system whereby the workmen might start savings accounts by depositing their savings with the accountant at the plant, or by simply adopting a plan of drawing only a portion of their wages, the rest being left with the accountant. By this means the men were helped to acquire money with which to establish homes. To further encourage the formation of homes, the firm made compacts with workers desiring to build, whereby the men bought their land from the firm at a sum well under the market value of property. Then the company agreed to lend them the money with which to build their houses. If they were unable to buy the land outright they were permitted to pay for it with small installments, but no money was advanced toward the building of the houses until the purchasers held clear titles to the land. The workmen planned and arranged for the erection of their own homes, this serving to give them a much keener interest in them than if they bought the houses, planned and built by some one else, and probably identical in design with a whole row of other houses. Figs. 1, 2 and 3 are illustrations of Schneider employes' homes.

The Schneider company, until 1870, kept its own stores at which its employes were able to purchase goods at a lower rate than at the local stores. Finally the merchants of Creusot protested against this and the company stores were closed. Later the workers themselves, desiring to obtain their supplies more cheaply, established co-operative stores. These have been very successful and in some cases the stores have extended their operations to include a system of mutual insurance on a small scale.

All forms of sport are encouraged among the employes and the Schneider establishment has always been very active in the building of parks and of pleasure places in general. Societies for the encouragement of different forms of sport have grown up, including among others the fencing club, the gymnasium club, the rowing club, etc.

Excellent medical service is provided. The hospital, which was started at the same time as the schools and is supported with them from the fund set aside for that purpose in 1838, is fitted out with the most up-to-date equipment. A staff of doctors is attached to the plant and the workers are able to call on them for free consultation. This privilege is also extended to the members of the employe's family, that is, to his wife, dependent parents, and children under the age of 12 years. If the children are members of the Schneider schools after that age they are still eligible for free treatment. The employe is accorded free treatment at the Schneider hospital. The members of his family, however, are charged the small sum of one franc, or about 20 cents, a day.

There are also various mutual benefit societies which receive the moral and material aid of the company. The same sum which serves as a support for the school and hospital is used also to provide for workers who have been hurt or whose health has in some way been injured by their occupation. A portion of it is also set aside to assure pensions to the widows and orphans of workers "who perished through their work at the plant".

Finally, as a fitting climax to this long list of benefits provided by this great steel company for its employes, we find the home for the men and women who have grown too old to any longer support themselves. The Schneider firm bears the expenses of this with the aid of small regular payments from the workers themselves.

These same plans for the welfare of the workmen are carried on at other of the Schneider plants in addition to the one at Creusot, the only difference being in method of organization and administration in different places. For the customs among the poorer classes in France change with the change in location, and the organization which proved very successful in one place might be most unpopular in another. The Schneider company has been wise enough to take this into consideration and to plan their work accordingly.

Book Review

Selling Your Services; board. 176 pages, 5½ x 8¼ inches; published by The Sales Service Co., and furnished by *The Iron Trade Review,* for $1.00 net.

The most effective methods of employing labor is a problem whose solution has occupied a position of increasing importance in the attention of the industrial public in recent years. How to get a satisfactory position, a subject closely akin to the first one and with an equal need of exposition, unfortunately, has played the poor relation in respect to the notice given it. The book under consideration offers itself as a remedy for this omission.

Each man has capabilities which make some particular form of occupation more acceptable than others to him. In the words of the book, "An axiom of life is that a man will be most successful in that field of work which he loves best." *"Selling Your Services"* attempts to make clear to the reader how he can discover this special field for which his talents fit him, and, having discovered it, how he can locate and secure work of the type he desires. The first step is to get, or keep, as the case may be, some kind of work, whether it chances to be of the most congenial type or not. The idea being that an employer looks with more favor on the man with a job who wishes to better his position than on the man without a job who, therefore, has to make bothersome explanations about why he is in that condition. If opportunity for beneficial change exists in the company with which the person ambitious for advancement finds himself, he is advised to stay with that company, as a reputation for business "loyalty" is a great asset to a man. If no such chance does exist, then the means for locating a position which will prove satisfactory must be investigated and the proper persons must be communicated with. It is always considered in better taste not to seek employment from a competitor of your present employer unless your work is of a type which precludes your entering allied industries.

How to find the new position is next considered. If it is to be located by means of a "situation wanted" advertisement, very good advice concerning the form of the advertisement is given. If the applicant is answering a "help wanted" advertisement, equally valuable instructions are given concerning the letter of application. The letter written and the visit made, the applicant is advised to keep himself in the mind of the men from whom he desires employment until he gets the position or hears that it is no longer available. The various follow-up methods are described and discussed.

The Story of Steel, written by Donald Wilhelm and copyrighted by the United States Steel Corporation, is designed to meet the needs of the business man who is interested in the production of iron and steel, but who does not care to be encumbered with statistics or involved technical terms. The various phases of production are described in an entertaining fashion so that the reader obtains a clear impression of the methods pursued in converting the ore into finished iron and steel products. The book has 64 8 x 11-inch pages and 832 illustrations.

Weldless Tires for Engine Wheels

The High Grade Product Used on Modern Locomotives Represents the Fruits of Nearly a Century's Progress—Co-operation Between Producer and Consumer Has Been the Stepping Stone to Reliability and Service

BY GUILLIAEM AERTSEN

IN THE infancy of railroads, the tracks consisted of flat bars of iron, spiked or bolted to the upper surfaces of longitudinal timbers, which, in turn, rested upon masonry foundations. Stone blocks installed for this purpose on the old Germantown & Norristown railroad, now the Chestnut Hill branch of the Philadelphia & Reading, were to be seen for many years on the right-of-way, north of what is now Wayne Junction, Philadelphia. The "cornerstone" of the Baltimore & Ohio railroad was laid April 4, 1828, and the first locomotive in America was built by Peter Cooper at the St. Clair Works, Baltimore, in 1829, "to demonstrate its adaptability to a curved road." It is believed that the first successful locomotive was built in Philadelphia by Tyler & Baldwin in 1832 for the Germantown & Norristown railroad. Rufus Tyler and Matthias Baldwin were brothers-in-law; the latter's name will be identified with American locomotives until locomotives are forgotten.

The wheels on these first locomotives, designed to run on this primitive rail, were shod with plain iron bands, bent and welded. The flanges consisted of separate iron bands, bent sidewise, welded, and bolted to the sides of the wooden fellies, or rims.

The First Tires Were Crude

Before many years had elapsed the tires were fabricated of iron bands, rolled in one piece with the flange projection on the side. The tire for each wheel was bent and welded and subsequently attached to the wheel center by shrinkage, bolts, rivets and various mechanical devices.

Germany is generally given the credit for first making such tires of steel without a weld, the ingot being cast solid, flattened, punched and subsequently spun, or rolled, on rolling mills designed for the purpose. Similar, or perhaps the same, mills had previously been used for "rounding up" the bent and welded iron tires. There is a tradition that weldless steel tires were made in the same manner in England about the time that their manufacture was being attempted in Germany, but trustworthy records of this practice in England at so early a date are not readily available.

As early as 1853 the German process was exploited, and before 1860 weldless steel tires were being turned out in considerable quantities there and in England. The popularity of these tires seems to have been instantaneous, their success being due not only to superior wearing qualities and accuracy of finish but also to increase in safety.

Crucible Process Used

Steel for tires was originally made in the crucible exclusively and the principal German maker had been engaged in their manufacture for many years, sending them to all parts of the world, before he ventured to introduce tires made from open-hearth steel. The ordinary practice was to cast individual ingots, poured from the top into cast-iron molds of great variety of shapes. The popular mold was pear-shaped, or the frustum of a cone with the small end up; this was for the purpose of reducing the area affected by shrinkage. The ingots were subsequently flattened under a steam hammer, a small hole punched in the resultant slab, or disk, and this hole enlarged by hanging the punched disk on the horn, or beak, of the anvil, or lower die, on which it was rotated while the hammer struck successive blows on the outer edge. During this operation, the flange, where one was required, was roughly shaped. After this operation, the "beaked bloom," as it was called in England, was rolled to required dimensions in the tire mill.

Some of these early tire mills seem to have been horizontal two-high bar mills altered by extending the rolls through the housing farthest from the engine and hanging the tire on this extension. Many manufacturers followed this idea in designing new tire mills; the rolls were horizontal and the tire was in the air while rolling.

It is interesting to note that even in these early days, tire manufacturers realized the improvement in quality that would be secured were it possible to cast material for tires in long ingots, cutting each into several blocks, one for each tire, and discarding the upper portion. As early as 1864, an English patent covering this was taken out. Each ingot was to be cut into four or five blocks by means of circular saws. A subsequent patent avoided the loss in sawdust by using, instead of saws, circular shears, or disks, the ingot being previously heated. These revolving disks were carried upon a shaft which, in turn, was supported at either end in eccentric bushings revolved by spur gearing so as to feed the shaft and its disks toward the center of the ingot until the cut was completed, when they were lifted to clear it. The hot ingot was supported by two corrugated rollers, driven, thus causing it to revolve. The shaft bearing the disks could also be driven either by separate gears or by the friction between the disks and the revolving ingot. The records do not show how successful this process was, but it seems to embody several ideas perfected by the next generation.

To avoid scrap in punching, a method was proposed in which a sharp-pointed instead of a flat-pointed punch was used. Ingots were top-cast in conical molds, small end up, the neck being closed after pouring by a plate clamped or cottered down upon it. Dead-melted steel did not seem to be expected in tire ingots.

Early Difficulties

The pioneers appear to have had great difficulty, at first, in punching, in a slab or upset ingot, a hole sufficiently large to admit the horn of the beaking anvil. One of the early methods was to drive a cutter, or wedge, about ¾ inch thick through the slab and afterward stretch and enlarge this slit by the introduction of tapered punches or mandrels. After this difficulty was overcome and the practicability of punches of circular cross-section proved, it seems to have been good practice if the four operations of upsetting, punching, beaking and rolling could be accomplished in four heats.

In the United States, prior to 1867, there were one or two mills designed for rolling, or rounding-up, iron tires. The manufacture of weldless steel tires had not yet been attempted. In that year, a member of an English family which had been long identified with the manufacture of cutlery, was induced by some Philadelphia capitalists to come to that city and establish a tire plant. From that beginning, 50 years ago, has sprung, directly or indirectly, all the other tire works in America.

At first, crucible steel was employed

A paper presented at the recent New York meeting of the American Institute of Mining Engineers. The author, Guilliaem Aertsen, is assistant to the vice president, Midvale Steel Co., Philadelphia.

exclusively. The open-hearth furnace was at that time not sufficiently perfected to justify its use for such purpose, although but a few years elapsed before it practically supplanted the crucible for this specialty.

At first, ingots of circular cross-section were poured from the top in cast-iron open molds, one ingot for each tire. To insure accurate weights pouring was stopped when the level of the fluid metal reached a chalk mark on the inside of the mold. Subsquently these molds were improved by the introduction of a cast-iron stopper, or heavy disk hung on the inside at the required height. This stopper, having a vent at its center to permit the air to escape, was suspended from a spider attached to the mold. After some years, top-casting was abandoned and all ingots were poured from the bottom. Still later, the practice of casting individual ingots, one for each tire, was replaced by the practice of casting long ingots, each of which was sliced cold into as many blocks as necessary and the top portion, enough to eliminate all danger from segregation and pipe, discarded. The advantage of this practice is self-evident. The slicing operation is stopped before the center of the ingot is reached, the remaining core being broken, so that the fracture at the center of the ingot can be examined.

In those early days, furnaces for heating high-carbon steel, as tire metal was then considered, were crude, and the circular cross-section of the ingots added to the difficulty. Consequently, it was thought necessary to give the ingots a preliminary, or "saddening" heat. They were charged into a comparatively cold furnace, brought slowly to a dull red heat, transferred to another hotter furnace and brought to the temperature necessary for punching. After this operation they were allowed to become cold; reheated and beaked; again allowed to become cold; reheated and rolled.

In a tire works with modern equipment, the sliced block is heated very slowly in a continuous furnace, upset, punched, beaked (when necessary) and rolled, without being allowed to become cold at any intermediate stage. The various operations are performed at a press, or hammers, and two or three mills, the partly finished bloom being transferred from one to the other with no appreciable loss of heat during the transfer. The results of this method are eminently satisfactory, the metal being continuously worked from the high forging heat to the proper temperature at which it should be laid down to cool.

Rolling tires differs from other rolling operations in one important particular not always appreciated by those unfamiliar with the details of the operation. In rail, structural or bar mills the billet is led from one pass to another, each designed to deliver the cross-section best suited for that following. Thus, in well-designed rolls there should be no risk of tearing or pulling the metal or setting up strains in one part of the section because its reduction has been less rapid than that of the adjoining section. On the other hand, in a tire, or other ring (except when it is possible to transfer from one mill to another), it is almost always necessary to accomplish the reduction in the same pass, without removing the tire therefrom, the reduction in the section being accomplished by forcing the rolls closer together while the metal is still between them. Any one familiar with ordinary rolling-mill practice will appreciate the difficulties this involves, and these difficulties are aggravated by the fact that in tires we are dealing with the cubical contents of the entire ring, not with the area of its cross-section alone.

Design of Tire Mills

The old tire mills were designed for tires of comparatively small diameter and thin sections and usually consisted of only four rolls, two of which might be called working rolls and two, guide rolls. One of these working rolls, the main roll, contained a single box pass, turned to fit the contour of the outside of the tire, the contour including the tread and flange with the front and back faces contiguous thereto. The other working roll, the pressure roll, was turned to coincide with the bore of the tire, being of exact width to enter the box pass in the main roll. One of these working rolls, usually the main roll, was rotated, or driven, by the engine, its bearings remaining stationary; the other working roll, usually the pressure roll, was rotated by friction between its periphery and the inside of the bloom as the latter rotated by friction with the main roll. The bearings supporting the pressure roll were carried on a slide, which, operated by hydraulic or screw power, advanced as required toward the main roll, thus reducing the opening between the two and the cross-section of the bloom or tire being rolled. The two guide rolls merely served to preserve the circularity of the tire by bearing against two points on its circumference equidistant from the main roll. They were driven only by friction between the tire and themselves and were carried back and forth on slides or carriages operated by screw or hydraulic power.

The more modern mills have four guide rolls touching the tire at four instead of at two points; they have a pressure roll similar to that described above except that its face is longer than the width of the bloom or tire being rolled; and they also have a main roll containing a very shallow box pass which does not cover or overlap the front aand back faces of the tire, and in addition, have two horizontal rolls, one driven by power, the other driven by friction, the latter being raised and lowered by screw or hydraulic power. With this universal type of mill, pressure is brought upon the section of the tire from all four sides, with beneficial results. These modern mills are, as may be imagined, more substantial and powerful than their predecessors. As a result the quality as well as the quantity of work turned out in more satisfactory.

Many changes, great though gradual, have occurred in the demands made by consumers upon tire manufacturers since the birth of the industry, and, as might be expected, most of these are for the better. The standardization of sections and diameters insures more satisfactory deliveries and eliminates many causes of error. The "mileage guarantee," usual in the early days, is now seldom demanded and still more seldom granted. Railroad-operating men appreciate that there are important factors affecting the hardships inflicted upon locomotive driving tires which can seldom be calculated, more seldom foreseen, and never observed or recorded. Safety can be demanded and secured. Wearing qualities would better be considered among the general results. Locomotive driving tires have sometimes shown abnormal wearing qualities, being apparently indestructible, and yet the efficiency of the locomotive shod with them has been reduced to a minimum by loss of tractive power.

One of the most successful manufacturers in Europe in the early days guaranteed that all the tires sent out from his establishment would do a certain amount of work before any repairs were placed upon them. This mileage guarantee was based upon the weight of the tire. It simply meant that for every pound of metal in the tire it would run 113 miles. This probably worked well in practice in those days, when the effect of brake action was nil, the loads were light, and practically the only difference in tires was their diameter, their section and the service to which they were subjected being the same. The heavier tire, larger in diameter though equal in thickness, would naturally outwear its smaller competitor, their lives being directly proportional to their weights.

In few specialties of the steel industry have producers and consumers worked so harmoniously in endeavoring to improve the quality of the product, and a comparison, could one be made, between tires manufactured in 1870 and those turned out today, would prove that this co-operative labor has not been in vain and without noteworthy results.

Novel Air Furnaces Conserve Labor

New Melting Units in the Buffalo Plant of the American Radiator Co. Are Designed to Eliminate Skimming of the Slag and to Simplify the Process of Charging

WHEN experienced malleable foundrymen are told that a large air furnace can be charged by two men and a craneman, that the laborious skimming of slag may be eliminated, and that the life of brick in the flues can be lengthened considerably by employing a properly designed furnace, they invariably express a sincere doubt as to the possibility of such an achievement. The belief that awkward methods of charging and back-breaking skimming are necessary evils of the malleable industry has become so firmly intrenched, that the mind of the average founder rebels at the thought of a revolutionary change in the operating methods. For that reason, the practice outlined in this article will undoubtedly prove a revelation to many who cling to the old ideas.

The malleable foundry of the American Radiator Co., in which these unusual developments have been made, is the outcome of a determination to broaden the scope of the company's plants to include the manufacture of nipple blanks and other malleable castings required in making radiators and boilers. The first result of this policy was the erection in 1912 of a malleable foundry in Germany. This plant had a daily capacity of 10 tons, and enabled the American company to furnish its European plants with malleable castings at a cost far below that of imported fittings from America, which were subject to high duties. The absence in Europe of black-heart iron, compelled American manufacturers to obtain their malleable requirements from the United States or to erect European plants. The American Radiator Co. and the International Harvester Co. were the first to adopt this method of overcoming the high duties imposed on American-made products.

War Balks Plans in Germany

The German plant was in full operation and a second and much larger one was in the course of construction when the war intervened in August, 1914, necessitating the immediate cessation of activities. With the operation of European factories completely balked, attention was focused upon the erection of a plant in America, and in 1915 ground was broken at Buffalo, for a malleable foundry to supply the radiator and boiler plants in the United States and Canada with malleable fittings. The general building layout and all furnaces, ovens and special equipment were designed by Harry E. Kies, manager of the malleable department, who also built and operated the European plant.

The buildings were designed with a view of getting all of the light and ventilation obtainable in modern foundry construction. Careful consideration was given to the cycle of operations to eliminate unnecessary handling of castings in their movement from one department to another. Special equipment was designed and built to do away with much of the hot and hard work usually found in a malleable plant.

The total floor space, not including the storage sheds, is 81,000 square feet. The roof construction consists of a 32-foot monitor extending east and west through the entire length of the main building. From this monitor, high bays 20 feet wide and 20 feet apart extend to the north and south walls. This arrangement provides for the distribution of light to all parts of the building. The side walls of the monitor and bays are about five feet high, and are equipped with sash pivoted at top and bottom, so that they swing vertically, giving almost a 100 per cent opening for ventilation when desired.

The roof at its highest point in the monitor is 21 feet from the floor, the lowest point on the sides being 19 feet from the floor. This provides ample head room for a five-ton crane which travels the full length of the east and west central bay, and serves the melting furnaces.

Fig. 8 is a plan view of the plant. The molding floors and melting department occupy the main portion of the building, and are separated from

FIG. 1—ONE OF THE 30-TON AIR FURNACES INSTALLED IN THE BUFFALO MALLEABLE FOUNDRY OF THE AMERICAN RADIATOR CO.

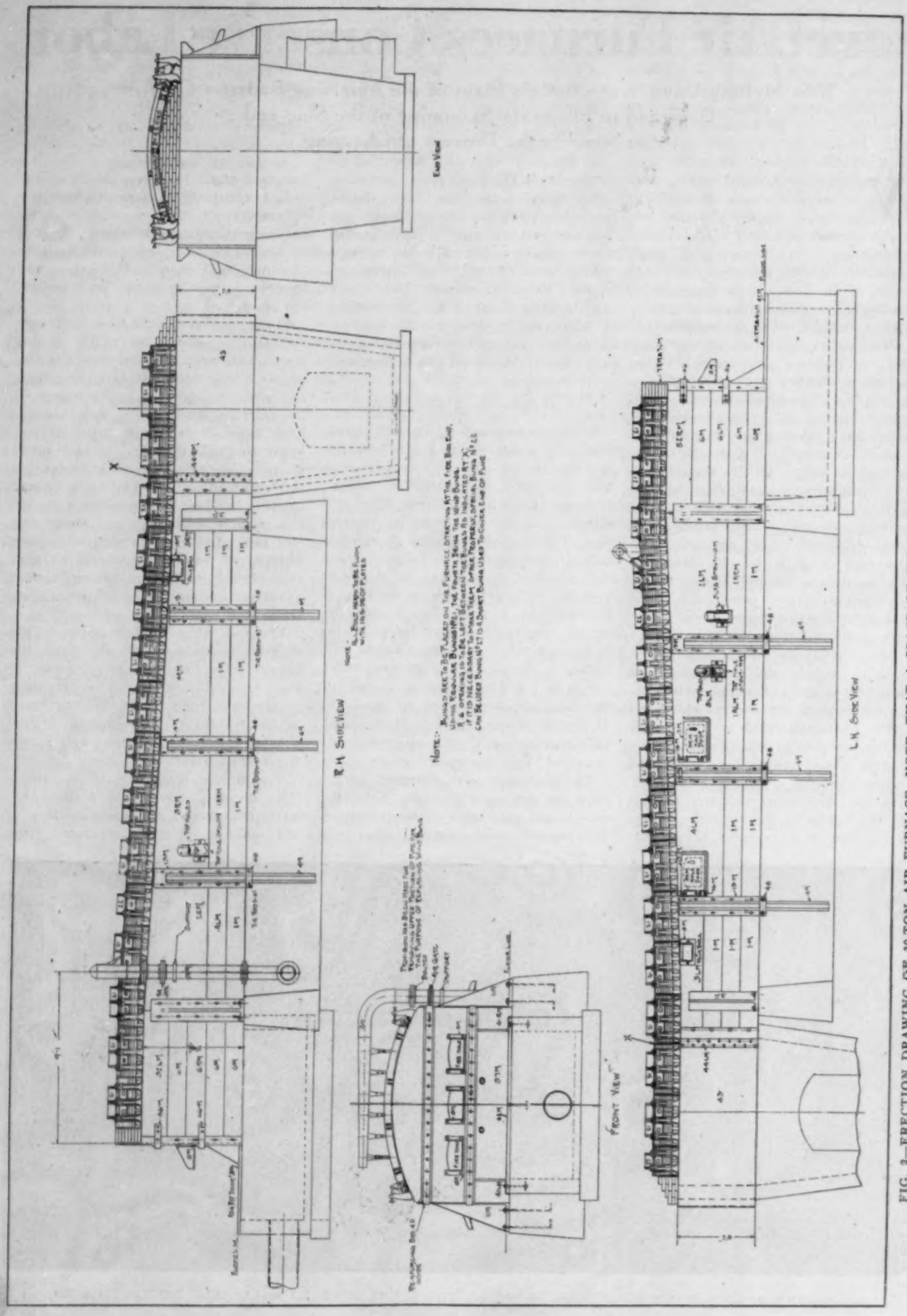


FIG. 2—ERECTION DRAWING OF 30-TON AIR FURNACE—NOTE THAT A SPACE OF SIX INCHES IS LEFT BETWEEN THE THIRD AND FOURTH BUNGS FROM THE REAR OF THE FURNACE

the cleaning, inspection, annealing and shipping departments by four-foot curtain walls, as indicated in the drawing. It will be noted that the castings move in a straight line in passing from the molding floors to the shipping room. This feature has been an important factor in lowering the cost of operation, and since it reduces the amount of labor required for handling castings, it has been an unusually valuable asset in these times of labor scarcity.

Construction of Buildings

The main building, as well as the auxiliary buildings are of steel, concrete and brick construction with three-inch booktile roofs. The molding floor is of red brick with the exception of the area near the furnaces, which is of clay. The cleaning, inspection and annealing departments are equipped with hexagon wood block floors. The core room, pattern shop and pattern storage room, locker room and shipping department have concrete floors. The floor line is 24 inches above the rails of the railroad sidings.

The most notable feature of this malleable foundry is the design of the melting equipment, which consists of three 30-ton air furnaces. These furnaces differ from the common type in that all air piping and discharge flues are under the molding floor of the foundry, permitting a clear runway over the furnace for a charging crane. One furnace is held in reserve, enabling repair work to be done during working hours.

Fig. 2 is an erection drawing of one of the furnaces. The over-all dimensions are approximately as follows: Width, 10 feet six inches; length, 45 feet; height above floor line (front), seven feet, (back), six feet. The furnaces are arranged in groups of two, the third furnace now installed being the first of a second group to be completed when the volume of business necessitates a fourth unit. The furnaces of each group are laid out so that the rear walls are about seven feet apart, and the flues are laid parallel from the furnaces to a common stack, as shown in Fig. 8. The air pipes lead from a Sturtevant fan in a corner of the core room, under the molding floor to a point near the fire box of each furnace where the pipes divide, part of the blast going into the ash pit and the other part being carried to six distributing nozzles over the wind bung. The pipe leading to the blast nozzles is equipped with an air gate and has a bolted joint which provides an easy means of disconnecting and removing the pipe whenever it is necessary to change or repair the wind bung.

Coal is supplied to the firebox through three fire doors at a height of about three feet from the floor line. The center line of the wind pipe is about nine feet from the fire box end of the furnace and the nozzles enter the bung at an angle of about 45 degrees. Tap hole spouts and pour-back basins are provided on both sides of the furnace, and a slag spout, and two skim-hole doors are on the left-hand side. Each tap-hole spout is arranged for two tap-holes, one above the other, enabling the furnaceman to draw off the hottest iron first.

Design of Bungs

The bungs used on this type of furnace are unusual in that they are made up of 3½ courses of brick instead of one, as in common practice. Fig. 3 clearly shows how this type of bung is constructed. Many failures of bungs are caused by the deterioration of a single brick which loosens the other bricks in the arch and causes a cave-in. These wide bungs having three full courses of brick instead of one, eliminate this trouble, and unless three bricks in the same tier give way, the arch cannot become loosened. The gradual shrinkage of fire brick, which is characteristic of all bungs, is compensated in this design by adjusting screws which take up the contraction of the brick from time to time.

Design Aids Charging

The heavy type of bung aids materially in charging the furnaces, as the craneman has only one-third the number of bungs to handle as in the case of furnaces whose bungs are made up of a single course of fire brick. Charges are made up in rectangular-shaped boxes equipped with a simple tripping device which allows the charge to pass out through the bottom. Each charging box contains about 4,000 pounds, and is easily handled by the five-ton crane already mentioned. The craneman with the assistance of two floor men can easily charge one of the 30-ton furnaces, and this feature is one of the best recommendations for the efficiency of the method of charging permitted by this design of furnace.

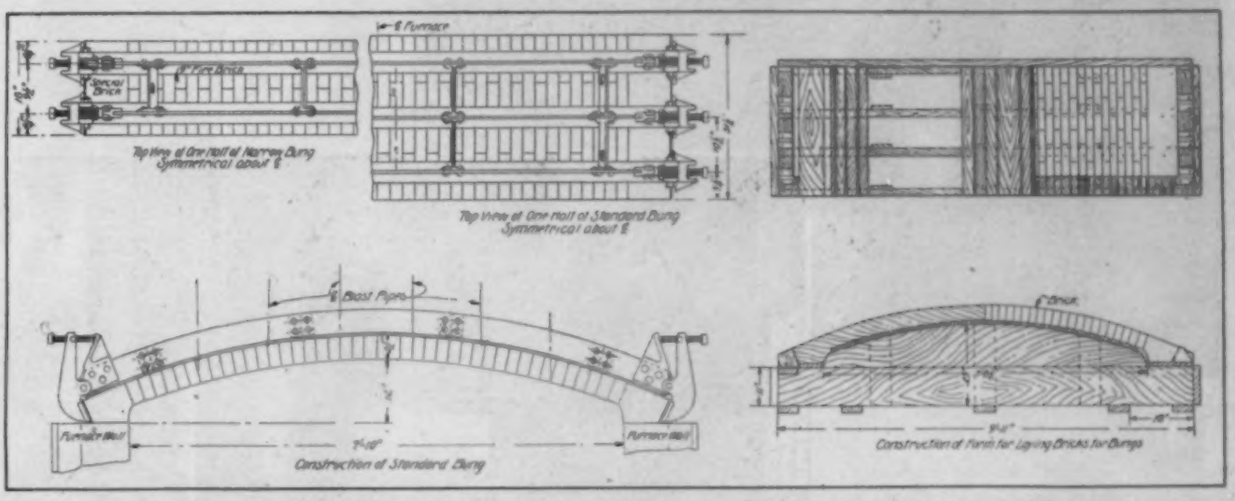

Top View of One Half of Standard Bung
Symmetrical about ℄
Construction of Standard Bung
Construction of Form for Laying Bricks for Bungs

FIG. 3—DRAWING SHOWING METHOD OF BUILDING-UP BUNGS FOR 30-TON AIR FURNACE

It will be noted in Fig. 2 that a space of six inches is left between the third and fourth bungs from the rear of the furnace. This arrangement serves as a damper, just behind the rear bridge wall, and so effectively cools the hot gases that second-grade fire brick is used in the flues with satisfactory results. Moreover, none of the bungs back of this air space have ever been renewed, showing that the six-inch air space actually performs its function in a remarkably efficient manner.

The side walls at the rear of this furnace differ from those of the com-

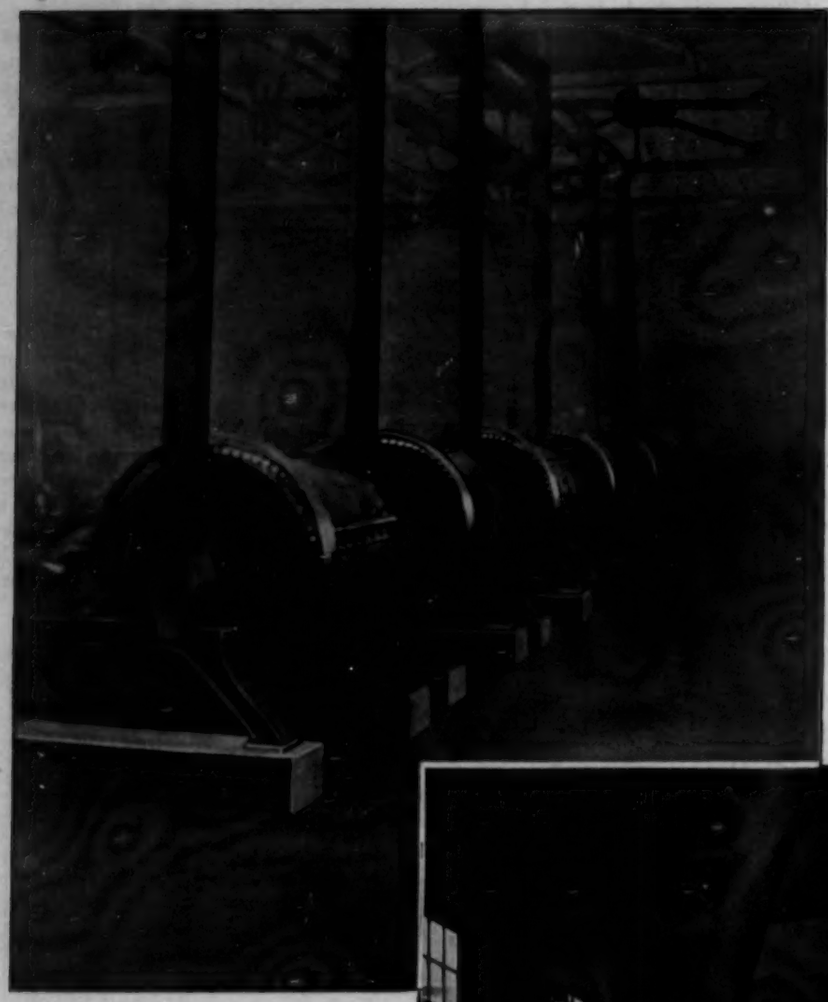


FIG. 4—A VIEW IN THE HARD IRON CLEANING DEPARTMENT

mon type. It has been the customary practice to taper them down to a contracted flue, thereby narrowing the furnace very materially at the back bridge wall. In this particular furnace the walls are parallel from front to rear, and it is believed that this arrangement has had a beneficial influence on the life of the fire brick in the side walls and flues.

Skimming is Eliminated

In operating the furnace, a number of hide-bound foundry rules, deeply rooted in the traditions of the malleable industry, have been completely ignored. The most notable exception to accepted practice is the method of handling the slag. Instead of skimming it from the surface of the iron, it is allowed to remain in the furnace until all of the iron is poured, when it is drawn off through the slag spout. When the slag has been run onto the floor of the foundry, the bottom of the furnace is practically clean, and there is no accumulation of cold slag to be removed before the charge for the next heat can be put in. Moreover, the loss of iron accompanying skimming is avoided. Under this method of operation the ratio of melt to fuel charge is 3 to 1, based on the figures covering operation for a period of one year. A heat of 30 tons can be melted in from 10 to 12 hours.

Advantage of Slag Covering

Naturally this method of operation raises a question as to the part played by the blanket of slag over the iron. Many founders claim that the melting efficiency must be reduced because of the resistance offered by the slag. Sponsors for the new type of furnace admit the truth of this claim, but insist that whatever heat is lost in penetrating the layer of slag is compensated by the advantages of this covering. One of the greatest factors in favor of the new practice is the elimination of heat losses due to the frequent opening of the skim doors of furnaces of the common type. Much of the heat imparted to the metal in an air furnace is due to radiation from the walls of the furnace. When the

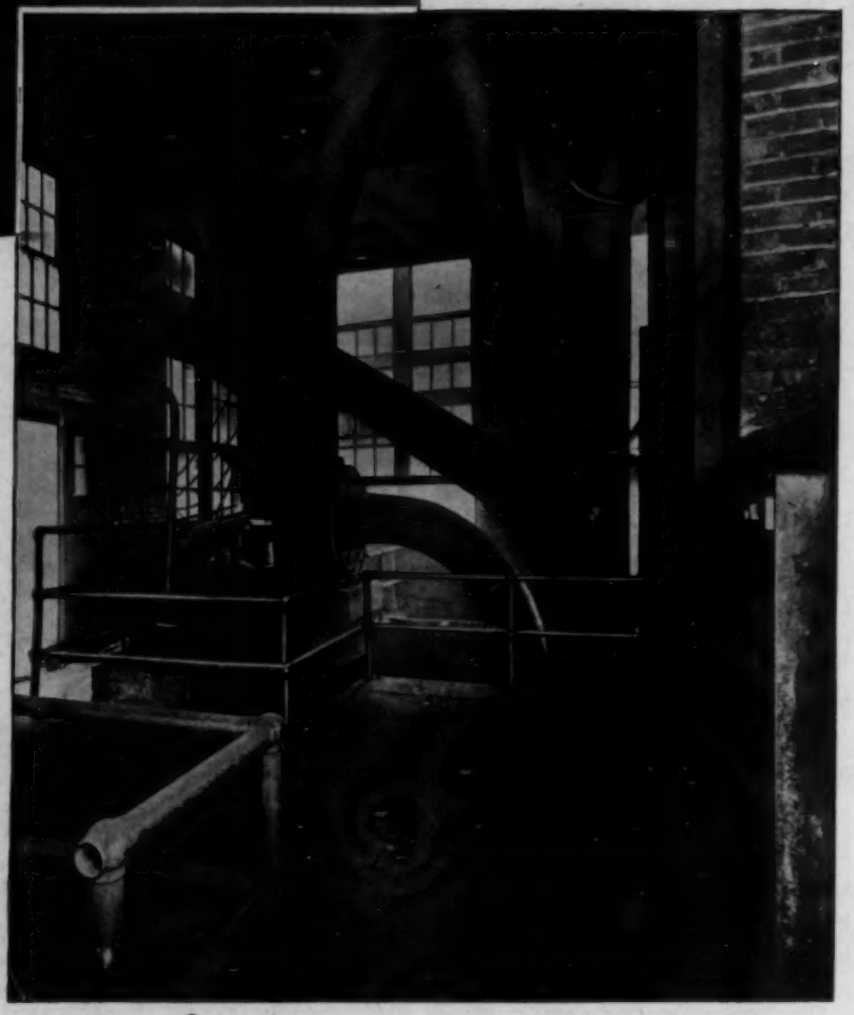


FIG. 5—MOTOR FAN AND FLUES IN THE POWDERED COAL PLANT

FIG. 6—ONE OF THE LARGE ANNEALING OVENS SHOWING ANNEALING POTS—POWDERED COAL IS USED FOR FUEL

FIG. 7—A CORNER IN THE SHIPPING DEPARTMENT—TUMBLING BARRELS AND GRINDING STANDS ARE SHOWN IN BACKGROUND

skim doors are open, heat is absorbed instead of radiated, and the heat loss chargeable to this cause is even greater than that due to the resistance of the layer of slag, according to the belief of persons who favor the new method of handling the slag.

Another advantage of the slag covering is its ability to hold the heat after it is ready to tap, without materially changing the analysis of the iron. This is sometimes occasioned when there are not a sufficient number of molds on the floor for the heat, making it necessary to allow the molders more time for preparing molds. On several occasions heats have been held for several hours, and the fact that the iron was in perfect condition when it was poured is thought to be due to the slag.

Fig. 1 is a view of furnace No. 1, taken just before the heat was tapped. The air space near the rear of the furnace is clearly shown, and the absence of overhead flues is noticeable. The box-shaped projection at the right of the tapping spout is a bank of sand enclosing the slag spout. This is a safety precaution, and absolutely prevents the accidental flow of slag from the furnace. The metal casing over this sand is removed just before the last iron is run off, and after the sand is pushed out of the way, the hole is tapped in the usual way.

Most of the molding is done on hand and power squeezers, while a number of different castings are molded on benches. After the castings are shaken-out, they are taken to the hard iron cleaning room, which is adjacent to the molding floors. The equipment in this department consists of two sand-blast barrels and dust collecting apparatus, and six tumbling barrels, shown in Fig. 4, which is a view of part of the cleaning room. Only a few feet from the line of tumbling barrels is a row of inspection benches. Every casting is inspected before it is annealed. When it is considered that 75,000 nipple blanks and 20 tons of general castings are made each day, and that these pieces range in weight from less than one ounce up to several pounds, it will be realized that the inspection is an important feature of foundry work.

The inspected castings pass to the floor of the annealing department. Here a novel device has been introduced to enable the men to pack the castings in annealing pots more carefully. In many malleable plants it is customary to pile annealing pots three or four high, and it is impossible for the men to use much care in packing the third or fourth pot, because they are so high from the floor that castings cannot be conveniently placed in them. This trouble has been eliminated by using hydraulic lifts or elevators which enable the workmen to adjust the height of the pots to their convenience. This simple device has removed much of the back-breaking work formerly connected with this operation and has resulted in better castings, for the packing can be performed much more carefully under the improved conditions.

The annealing ovens are arranged in a line at the south of the large room in the main building. The walls of each oven have an air space of 4½ inches between the course of brick for insulating purposes. The doors are of the same construction and

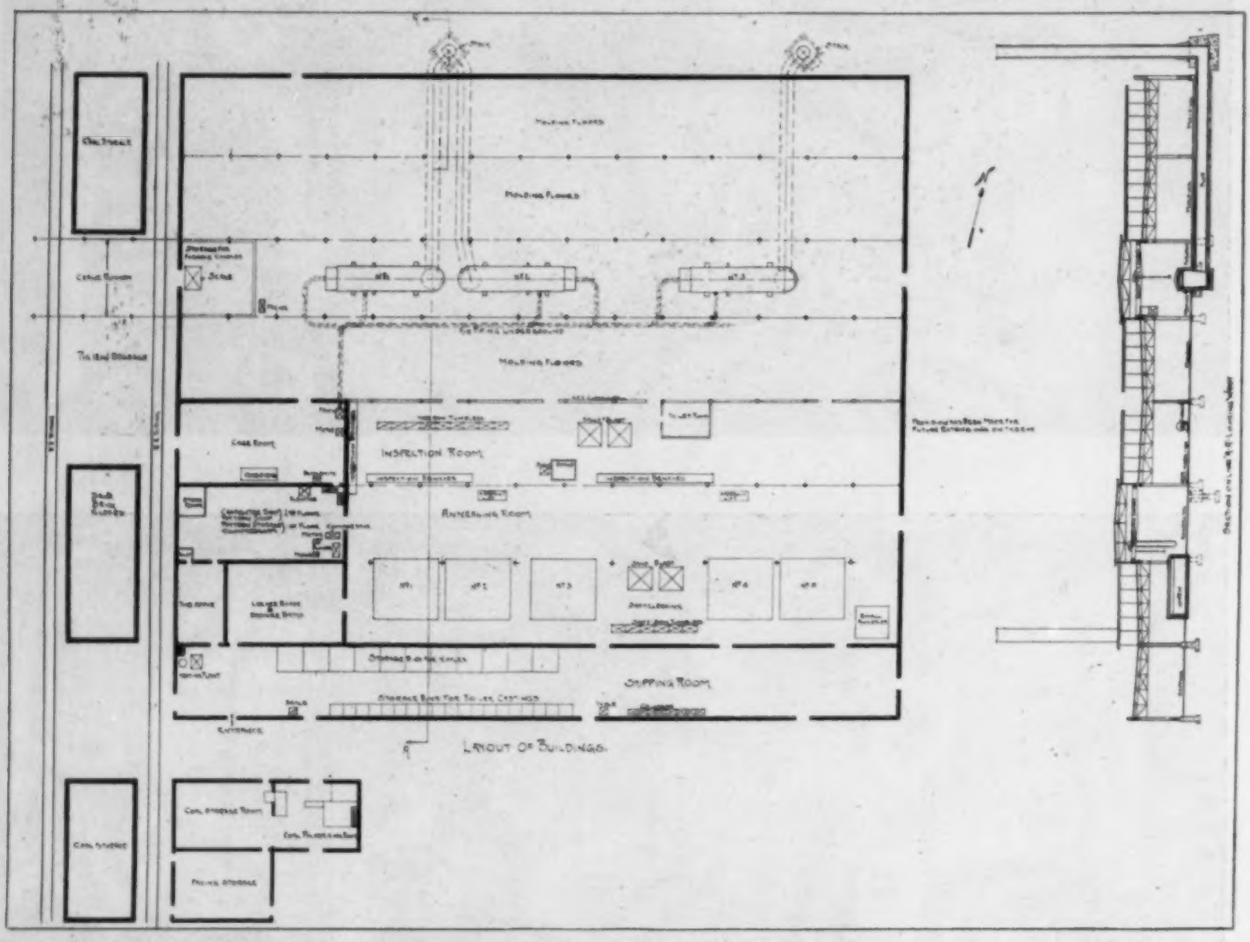


FIG. 8—PLAN VIEW OF MALLEABLE FOUNDRY SHOWING ARRANGEMENT OF DIFFERENT DEPARTMENTS TO FACILITATE THE MOVEMENT OF CASTINGS

are handled by means of an electric crane. The annealing pots are placed in the furnace by a steam-driven charging machine. One of the ovens is shown in Fig. 6.

The annealing ovens are heated by powdered coal delivered to the annealing room through flues from a pulverizing plant. Fig. 5 is a view of one corner of the pulverizing plant showing the fan and motor which furnishes the blast for carrying the powdered fuel to the storage bins over the annealing ovens. Dry coal is fed directly to the grinding mill, while moist coal passes through a coal-fired drying apparatus and then into the grinder. Suction from a fan draws the fine particles of coal up into the flues and carries them into large rectangular receptacles over the annealing ovens. A blast of air carries the fuel from these bins into burners at the rear of the ovens.

The coal pulverizing plant has a capacity of 5½ tons per hour and reduces the fuel to a fineness of 85 per cent through 200 mesh. In addition to the powdered coal for fuel purposes several thousand tons of facing is packed in bags and delivered to the various plants of the American Radiator Co. each year.

A small annealing oven which was first built for experimental purposes has proved of unusual value in expediting the movement of special orders through the shop. The time required for annealing castings in the large ovens is approximately seven days, while a period of three days is sufficient in the small furnace. This feature of the American malleable plant enables the company to turn out finished castings in record-breaking time when its customers are hard pressed for malleable products.

The soft iron cleaning department is equipped similarly to the hard iron department. A battery of double-stand grinders occupies the southeast corner of the shipping room. Fig. 7 shows a corner of the soft iron cleaning and inspection room.

The sorting of the castings is accomplished by selecting pieces of the same pattern from a long bench of cleaned castings and throwing them into rectangular boxes placed at convenient intervals on the floor. A bench of unsorted castings is shown at the left in Fig. 7. Every effort is made to reduce the number of different kinds of castings in each heat, but in spite of this precaution, a large variety of pieces always remain to be assorted.

The shipping room, which runs the full width of the main building also has storage facilities for 1,000 tons of nipple blanks and other castings for the American Radiator Co. In addition to making malleable fittings for this company, job work for many other manufacturers is produced. The average weight of the castings is 0.44 pound, and the product consists of all kinds of automobile castings, wrenches, washing machine parts, and shelf hardware.

Auxiliary departments which contribute to the general efficiency of the foundry are a pattern shop, core room, pattern storage room, carpenter shop, and forge shop. Separate lockers are provided for each workman and shower baths have been installed. The offices are situated in the southwest corner of the building.

The extensive laboratories of the American Radiator Co., located in the department of thermal research, are within a few hundred feet of the foundry, and offer a service rarely at the command of a malleable plant. A sample of iron from every heat is analyzed and tested, and a record of tensile strength, elongation, ductility, etc., is kept. These records are carefully filed, and the data regarding any particular heat are always available for reference by those in charge.

Using Pyrites Cinder in Blast Furnaces

BY W. W. TAYLOR

DURING the past four years the writer has used thousands of tons of pyrites cinder in making foundry and forge pig iron. Some observations on the manner in which this material behaves in a blast furnace especially designed for the purpose may be of interest to manufacturers of pig iron. The cinder was used in the raw, nodulized, and sintered states.

Pyrites cinder is produced in lump and fine grades by roasting pyrites for sulphur. Generally speaking, there are the Spanish and the domestic grades of both. Lump Spanish pyrites cinder averages about 60 per cent iron; about 7 per cent silica; 2 per cent sulphur; 0.50 per cent zinc; 0.20 to 2.00 per cent copper, depending on locality of pyrites; lead in varying quantity; and silver and gold. Barium and strontium have also been reported.

Fine Spanish pyrites cinder analyzes about 58 per cent iron; 7 per cent silica; 3 per cent sulphur; the percentage of other elements is about the same as in the lump cinder. The sulphur in both the Spanish lump and fines is mostly in the form of sulphide. Lead, barium and strontium, if present, are probably in the form of sulphates in part. Lump domestic pyrites cinder, made from pyrites mined in Virginia and other states in the Appalachian range, is usually of a lower grade. The metallic iron averages around 53 per cent and the sulphur content is about 2.50 per cent. It also contains lead, zinc and precious metals, as well as barium. Domestic fines analyze about 50 per cent iron and the sulphur may often run up to 4 or 5 per cent. In both the domestic lump and fines more sulphur is present as sulphate, which makes it difficult to work a large percentage of the lump "raw" and make good pig iron.

Effect of Lead

Furnaces with large stoves that give a hot blast, and blowing engines that furnish high pressures are essential in handling charges containing large percentages of cinder. At times, when the lead is high in the cinder, the furnace slips and the iron is dense and close-grained. With high percentages of lead and zinc, a stop at cast time shows gas burning around the tuyere noses; the uninitiated would believe such a condition to be due to water leakage. By knocking down a cap and raking the blow pipe, a fine powder, which ignites with almost explosive suddenness on contact with the air, is noted. It causes bad burns and it is advisable to use a long-handled scraper when investigating. This is supposed to be some oxide of lead which comes back from the hearth into the blow pipes when the furnace is stopped. It does not burn with the characteristic zinc flame.

At such times, melted lead will ooze through cracks in the jackets and drip down in the trough or on the ground. The writer saved seven tons of this and sold it to a smelting company. The assay showed 67 ounces silver and 0.4 ounces gold, and the precious metal content returned about as much as was received for the lead. The zinc is recovered in flues as flakes and from dust under stoves and boilers. The dust under the last pass of an installation of Sterling boilers analyzed 28 per cent zinc and 10 per cent soluble potash in one instance.

In working large percentages of

The author, W. W. Taylor, is consulting mining and chemical engineer, Lynchburg, Va.

"raw" a basic slag is necessary to remove the sulphur. When using 37 per cent "raw" frequently the slag will analyze over .4 per cent sulphur. High heats are always desirable. At times these high heats demand blowing engines that will blow as high as 20 to 25 pounds pressure. It has been found advisable to use high manganese ores in connection with large percentages of "raw" on the furnace to help control the sulphur. When nodules are used, the product is more uniform and the slag can be made more acid. This is because the process of nodulizing removes a part of the zinc and lead. A slag high in magnesia is desirable, as the magnesia makes the slag more fluid.

Practice has shown it advisable to periodically scour the furnace. To do this, all pyrites cinder is taken off the burden; then extra coke and ore free of lead and zinc are charged. The furnace is kept hot and the blowing engines are driven hard. The furnace will slip and cough for a time, but the cinder will sharpen and the iron will clear up and the grain come back, and when in the judgment of the superintendent, the scouring has been carried far enough, the regular mixture is put back on. It is possible by extravagant use of fuel to hold the grain in the iron and not scour the furnace so often, but with high-priced coke and short tonnage, the commercial side must have careful attention.

It is believed that the lead is the direct cause of the close-grained iron, when the furnace is not working properly. The heats and the blast pressure may be normal, but the number of charges will gradually become fewer per 24 hours, while the iron made will not always look irregular when going down the runner, yet at times, it will show a smoke mantle from the skimmer to the end of the house. This smoke is a grayish brown in color, seemingly due to oxidation of the lead. Although the iron will analyze within the limits in silicon, sulphur and manganese, yet it will be entirely void of grain and will be weak and brash. This iron can be used in a mixture with other pig irons with open grain, and the resultant mixture serve the ordinary purposes for foundry metal, but if used by itself in a foundry, it will be weak and will make fragile castings.

Sinter made by the Dwight and Lloyd process from both foreign and domestic pyrites cinder appears to carry more zinc and lead than nodulized material, made from the same cinder. This is because the heat and time for agglomeration is not so great in the sintering process as it is in the nodulizing kilns. Both sinter and nodules may have the same iron content and be equally low in sulphur, yet the zinc and lead, particularly the latter, will inevitably be lower in the nodules, making them more desirable for charging. Sinter made from flue dust from furnaces using lake ore is free of lead and therefore an entirely different product from sinter made from pyrites-cinder fines. Pyrites-cinder sinter is a valuable mix for furnaces, but has its limitations. It cannot be used in so large a percentage as the nodulized material, as already indicated.

The sintering machine has a great advantage over the kiln in one respect. The machine sinters a flue dust charge and uses the waste coke braize from the furnace. It may be possible to remove the lead and zinc by leaching before manufacture of the sinter, but the subject of leaching is without the scope of this article. The writer has found one point which is interesting in connection with the use of pyrites cinder. If a little mill cinder is used, say 6 per cent of the burden, the furnace will drive faster and will hold on grade better. The fuel will actually be lower per ton of iron over a period of 30 days when the mill cinder is used than over a similar period when it is not in the mixture. With a small amount of mill cinder the product is more uniform and the grain of the metal generally more open than when mill cinder is not used.

Profit Sharing in United States

A bulletin on Profit-Sharing in the United States, recently issued by the United States bureau of labor statistics, classifies two forms of profit-sharing in operation in this country—one under which distribution of a specific proportion of the net profits is made to at least one-third of the total number employed, including employes in occupations other than executive and clerical, and the other a limited profit-sharing plan under which less than one-third of the employes, excluding employes other than executive and clerks, are active participants.

There are, however, bonus and stock purchase plans, popularly known as profit-sharing plans, involving payments of a percentage of earnings based on length of service, or distribution of stock subscriptions, but these are not, properly speaking, profit-sharing plans. The bulletin presents a careful examination and analysis, with statistical data of all the plans in operation, describing in detail the arrangements in specific establishments and pointing out the factors which determine profits, the conditions under which they are distributed, the proportion of total employes who participate, the occupations or types of employment of participating employes, the benefits accruing to participating employes, the cost to employers, and the results secured through the operation of the plans.

Many Favor the Plan

There are known to be 60 establishments in the United States operating under the first plan, the profits distributed ranging from 2 to 100 per cent of wages. Payments mostly are made in cash, although in some cases stock is given. Thirteen of these firms are in Massachusetts, and 26 are manufacturing establishments. Of 34 employers reporting, the cost to more than one-half was less than 6 per cent of their respective payrolls. Five employers paid 20 per cent or over. In these 34 establishments 82.9 per cent of the employes participating were other than executives, clerks or sales people. Of 37 establishments, 51.4 per cent reported 80 per cent or more of their employes participating.

The number of firms conducting a limited profit-sharing plan is very large. Of 17 reporting, almost all bar the wage earner or manual worker. In most of these the payments are made in cash, the usual practice being to set aside arbitrarily a percentage of the profits after meeting all legitimate expenses of the business, including interest on the investment. In 18 establishments approximately 74 per cent of the participating employes were executives, clerks or sales people. In 10 of the establishments the proportion of participants was less than 10 per cent of the number employed.

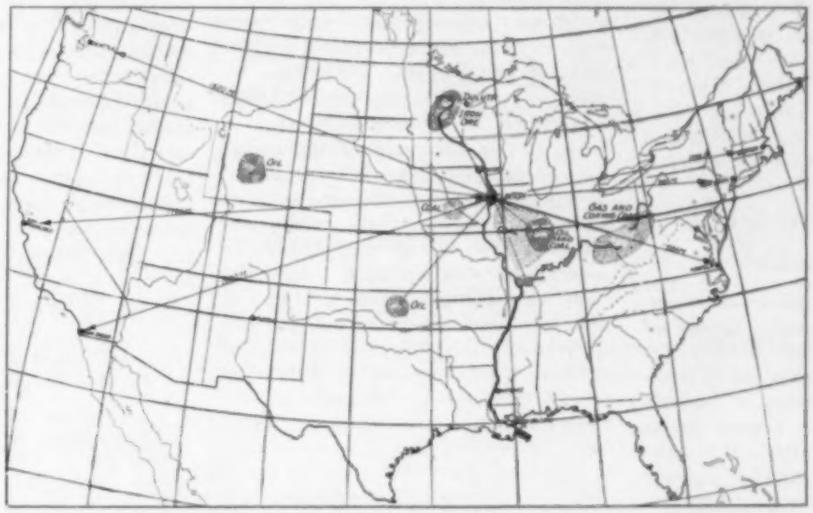
Under many of the bonus plans the employe's share is merely a gift and bears no relation to profits realized. Three specific plans are described in detail, giving rules governing their operation, benefits accruing to employes, cost to employers, etc. One plant operating under this plan distributed in the first year to 69.7 per cent of all employed a total of $8,434,849 on a regular payroll of $14,021,067.

These various actual and so-called profit-sharing plans have resulted in establishing more satisfactory relations between employers and employes and have contributed considerably to the stabilization of the working force, but employers are not agreed as to the results achieved with reference to increasing the individual or collective efficiency of active participating employes.

Will it Pay to Make Steel in Iowa?

A Group of Financiers Has Planned to Build a Blast Furnace and Steel Products Plant at Clinton, Ia.—Many Advantages Offered by This Locality Give Weight to the Project

A GROUP of business men is making arrangements to establish a blast furnace and steel products plant, requiring an investment of several million dollars, to be located in the vicinity of Clinton, Ia. The project, as outlined at the present time, includes a blast furnace, which is to be supplied with ores from the Superior range, a coke-oven plant, which will use a mixture of eastern and Illinois coals and a steel products plant which will cater to the agricultural implement manufacturers. It is also proposed that the enterprise include a wire mill. The most salient feature in favor of the scheme is the comparatively short distance from Clinton to the great Lake Superior ore deposits.



MAP OF UNITED STATES SHOWING LOCATION OF CLINTON, IA., WITH RESPECT TO SOURCES OF RAW MATERIALS AND IMPORTANT SHIPPING CENTERS

The sponsors of this scheme have pointed out that the possibilities and advantages offered by an all-water route from St. Paul are not to be disregarded. The Mississippi is navigable for many miles above St. Paul, in fact, its headwaters are right in the center of the Cuyuna ore range, so there is a possibility that locks around St. Anthony falls will complete the last link in the waterway from Clinton to the ore. Clinton is 450 miles from the ranges by an all-rail route, and in face of the potential water competition, it is presumed by the men who are backing the scheme that a rate of $1.50 per ton from the range to Clinton could be established if a blast furnace were to be built in that city. Perhaps the most prominent feature of the all-rail plan of transporting the ore is that such a plan would reduce the handling of the ore to a minimum. The idea of moving the ore to Clinton by barges on the Mississippi presents many economies that are of prime importance. River barges are inexpensive to build and require but little maintenance.

It is interesting to note that years ago a group of financiers and business men, including James J. Hill and Artemus Lamb became interested in the ore deposits located in the Waukon district in northeastern Iowa and decided that Clinton was ideal for the location of a plant to develop these ores. The project did not materialize because it was found that these Waukon ores were too high in phosphorus. Of course, improvements in the art of steelmaking have been made since that time, but it is doubtful whether these ores could ever be used except as a minor ingredient in a blast furnace mix. In spite of the proficiency of modern electric furnaces, it is questionable whether steel made from such ores could be properly refined by this method.

Regardless of how cheaply the ore could be brought to Clinton, it would be useless to consider the establishment of a blast furnace industry unless coke could be provided at a rate per ton as low as that on coke brought to Clinton from Connellsville. The sponsors of this new enterprise have therefore included in their plans the establishment of a by-product coke oven plant. To operate such a plant economically, it will be necessary to produce a volume of coke considerably in excess of the amount required by one blast furnace. Basing their conclusions on the fact that coke satisfactory for blast furnace consumption is now being produced in the middle west with as little as 30 per cent eastern coal, the remainder being made up of coal from Illinois, Indiana and Kentucky, these men believe such a plant would be practical. It is proposed to bring such eastern and Kentucky coal as may be required to Clinton on barges down the Ohio river and up the Mississippi river. It is planned to send the excess coke to the northwest by loading it into the cars or barges which have been used to bring the ore to the furnaces from the ranges. Limestone, the third essential in the production of pig iron, is quarried extensively in the rich limestone country in which Clinton is located. Clinton is located in the center of the food producing district of the United Stated, and in a territory which is comparatively uncongested, so that the men who are pushing the plans for this industry do not expect to experience any difficulty in solving the problems of food supply and housing laborers who would be employed in such a plant as is contemplated. They also point out that neither the intense cold of the north nor the vitiating heat of the south characterizes the climatic conditions obtaining in the vicinity of Clinton.

The Clinton commercial club has sent a petition to the secretary of the navy, Josephus Daniels, in which it sets forth the advantages of Clinton as a site for the proposed armor plate plant. In this report the organization points out the conclusion that the intention of business men to invest considerable capital in an iron and steel

industry at Clinton emphasizes the logic of establishing the armor plate plant at this point. It is also indicated that the civilian plant will be able to supply the armor plate plant with the necessary pig iron, molten, in ladles, if the government should so desire. The men have secured an option on an island which they agree to furnish the government free of cost should it decide to locate the armor plate plant at Clinton.

The market for steel products made in Clinton embraces a large territory. This territory could be served by both river transportation and by the railroads. The Mississippi river, navigable from New Orleans to St. Paul, is crossed at Clinton by the Chicago, Burlington & Quincy, Rock Island & Pacific, Chicago & North-Western, and the Chicago, Milwaukee & St. Paul railroads. These men, therefore, in consideration of the fact that the site is so favorably situated on these highways of commerce, believe that it would be particularly advantageous to erect a steel products plant at Clinton in conjunction with the blast furnace.

Vocational Survey At Minneapolis

The results of a vocational education survey of Minneapolis, conducted in 1915 by the National Society for the Promotion of Industrial Education, are brought together in Bulletin 199, just issued by the United States bureau of labor statistics. The aim of the survey was to get facts about the schools and vocations of the city in order to submit recommendations for a program of education by which young people might be trained in the schools to meet the demands of the various commercial enterprises located in Minneapolis, with a minimum of economic loss to industry and a maximum of technical or vocational instruction to the individual. Therefore, most of the bulletin is devoted to a presentation of the results of this intensive study, showing for each industry in the city what vocational education is needed properly to equip boys and girls for work therein.

At the outset it is shown that the schools are not adequately meeting the need for this kind of training because they devote too little time to such instruction, their facilities are insufficient, and their courses of study are not based scientifically upon the demands of local industries, and, so far as the high schools are concerned, do not fulfill the needs of that large percentage of students who do not remain four years. In the public evening classes, whose chief function should be to provide general and vocational education for wage earners, the greatest difficulty seems to be an inability to give instruction of a kind to meet the interests and requirements of the mixed group coming from a variety of occupations with a diversity of motives. Adequate instruction should be made possible by providing additional funds. Other agencies are suggested as meeting in a measure the need for vocational education. The general university extension division of the state university has been hampered by lack of funds; the Dunwoody Industrial Institute has made a commendable beginning, but has not definitely discovered the field in which it can be of most service to the youth of the city; the Y. M. C. A. evening industrial and commercial classes have proved of practical help; private commercial schools, denominational schools, and correspondence schools have each done much in preparing ambitious boys and girls for self-support. Very little reliance is placed upon apprenticeship as a means of training workers.

One of the outcomes of the survey was the establishment of trade understandings providing for co-operation between schools and the trades and industries, by which the former are undertaking to adapt their courses of study to meet the needs of industry and the latter have agreed to give preference in the selection of workers to those who have availed themselves of such instruction. Examples of such understandings are included. These trade understandings are recognized as a distinct contribution to the movement for vocational education and schools and classes operated under them will be able to select and train a group of young people who with their superior equipment will become in time either all round workmen or leaders in industrial life.

In recognition of the fact that for any comprehensive scheme of industrial education to be efficient and enduring it must command the respect and support of employers, employes and their organizations, the survey gave considerable attention to this question. As a result, practically all the important employers in most of the trades and occupations approved the plans for all-day, part-time, dull-season and evening classes, and agreed to co-operate with the schools in a definite way to make these classes successful.

One purpose of the survey in its study and recommendations was to appeal to the desire for higher efficiency on the part of workers and to encourage employers not only to adopt more systematic methods of selection and promotion of workers, but to show their willingness to reward efficiency—a policy which would result in more general attendance at vocational classes and on the whole be mutually profitable. Part time instruction is strongly recommended by the survey committee, but the difficulty of inducing employers voluntarily to release youg people during working hours, so that they may get further education, is recognized.

Mine Fatalities in 1916

The returns received by the bureau of mines from the various state mine inspectors show that 1916 is a banner year in the low record of coal-mine fatalities in the United States. The decrease is about 3 per cent as compared with 1915, while the production of coal increased about 12 per cent. The number of fatalities reported during the year was 2,225, as compared with 2,269 for 1915. On the basis of the number of men employed in 1915 the fatality rate was 3.03 in 1916 as compared with 3.09 per 1,000 men employed in 1915. This is the lowest rate since 1898, when about one-half the number of men were employed. During 1916 there were 11 mine disasters in each of which five or more men were killed, being the same number as in both 1915 and 1914. The number of men killed by these disasters in 1916 was 154, the lowest since 1901, as compared with 262 in 1915, 316 in 1914 and 464 in 1913.

Directory for Russia

The American - Russian chamber of commerce, 60 Broadway, New York, announces the publication of a hand-book of commercial information in regard to the United States, entitled *Industrial America*. This book is printed in Russian and will be distributed under the joint auspices of the American-Russian chamber of commerce in New York and the Russian-American chamber of commerce in Moscow, to approximately 5,000 Russian business firms.

This book said to be the first of its kind ever attempted, presents a comprehensive survey of the industrial resources and of the industrial, financial and commercial development of the United States. It contains a classified directory which furnishes the Russian business firms with the names and addresses of approximately 2,500 American concerns interested in the Russian market. The book also contains a concise presentation of striking and interesting features of American railroad organization, the American banking system and a number of other phases of American business organization.

Pig Iron Export Movement Declines

Movement Drops Below 70,000 Tons for the First Time Since Last September —Semi-Finished Tonnage Mounts to High Figures—Imports Show a Falling Off in Most Lines

THE first month of the year showed a decline in pig iron exports from the figures of October, November and December, 1916, when the shipments totaled over 100,000 tons for each of those months. The January movement was 69,146 tons, as compared with 105,195 tons for December, 102,786 tons for November, and 101,756 tons for October, 1916. The exports of billets, blooms and other semi-finished material were 183,656 tons, an increase over December, 1916, of 20,755 tons; this was the largest tonnage of semi-finished exported in over a year. The following table shows the exports of pig iron and semi-finished material for the seven months ending January, 1917, in gross tons:

IRON AND STEEL EXPORTS, GROSS TONS.

	January,		Seven months end'g January,	
	1917.	1916.	1917.	1916.
Scrap	23,012	16,681	136,881	75,495
Pig iron	69,146	19,319	522,987	156,647
Billets, ingots and blooms of steel	183,656	55,315	1,094,116	419,155
Wire rods	7,467	8,104	84,172	98,055
Steel rails	76,493	40,400	375,711	337,187
Steel bars	57,359	58,402	465,059	317,232
Iron bars	5,172	5,997	39,136	36,412
Struc. iron & steel	28,590	19,482	201,870	161,424
Hoops, bands and scroll	4,753	3,399	25,973	22,577
Sh'ts & plates	62,512	39,654	338,742	291,747
Tin and terne plate	23,408	12,178	127,960	119,810
Barbed wire	17,125	33,994	230,989	193,039
All oth. wire	17,736	15,449	155,822	141,203
Cut nails	288	229	3,153	2,768
Wire nails	7,225	10,999	85,194	67,493
All oth. nails incl. tacks	1,637	594	9,942	6,180
Pipes & fit'gs	17,013	14,842	157,387	106,879
R. R. spikes	2,075	1,792	10,227	12,496
Bolts, nuts, rivets & wash'rs	3,130	2,336	17,944	18,761
Horseshoes	103	786	2,917	8,918
Cast radiators	205	150	1,624	1,508
Total	608,105	360,102	4,087,806	2,594,986

The total value of exports of iron and steel and manufactures thereof for January was $108,423,640, compared with $51,643,807 in January, 1916, and $88,136,958 in December, 1916, while for the seven months ending January, 1917, the value was $604,574,281, compared with $300,965,569 for the same period ending January, 1916—over twice as large a value. The comparative figures for imports of iron and steel and manufactured products are analogous, showing an increase for the seven months ending January, 1917, of $6,181,645, over the same period ending January, 1916. The value of imports for January, 1917, was $2,839,242, compared with $1,251,298 for January, 1916, and $2,722,246 for December, 1916.

IRON AND STEEL IMPORTS, GROSS TONS.

	January,		Seven months ending January,	
	1917.	1916.	1917.	1916.
Scrap	28,066	4,596	114,431	70,934
Pig iron	9,428	9,422	84,032	66,864
Ingots, bl'ms and billets of steel	1,884	584	12,336	8,849
Wire rods	3	26	2,063	2,575
Rails	271	455	10,596	38,425
Bar iron	47	369	3,895	4,757
Structural	197	164	664	740
Sh'ts and plates	265	146	1,093	953
Tin & terne pl'te	31	62	518	343
Total	40,192	15,824	229,628	194,440

IMPORTS AND EXPORTS, GROSS TONS.

1915.	Imports.	Exports.
July	20,858	380,340
August	27,556	405,850
September	23,345	382,113
October	34,318	349,843
November	37,131	362,764
December	35,408	353,853
1916.		
January	15,824	354,416
February	20,279	368,869
March	15,159	438,054
April	20,176	384,917
May	32,114	540,580
June	26,786	526,759
July	14,729	503,187
August	32,257	597,739
September	25,559	643,762
October	30,169	610,110
November	42,545	554,856
December	44,134	580,957
1917.		
January	40,192	608,105

Manganese ore imports remained steady; in January, 49,530 tons of ore were imported compared with 49,796 tons in the previous month, and with 16,648 tons in January, 1916. Imports of ferro-manganese took a brace and showed an increase of 1,681 tons over December, 1916. The ferro-manganese imports for January, 1917, totaled 6,211 tons, compared with 4,531 tons in December, 1916, and 6,232 tons in November.

EXPORTS, GROSS TONS.

1916.	Pig iron.	Semi-finished material.
Jan.	18,719	55,315
Feb.	15,061	87,306
Mar.	19,110	107,696
Apr.	18,518	88,764
May	28,293	142,782
June	48,770	116,425
July	28,718	135,827
Aug.	60,264	160,921
Sep.	64,122	163,104
Oct.	101,756	162,679
Nov.	102,786	125,038
Dec.	105,195	162,901
1917.		
Jan.	69,146	183,656

Exports of scrap were nearly 10,000 tons more in January than in the month previous and for the seven months ending January, 1917, were 136,881 tons, as compared with 75,495 tons for the same period ending January, 1916. The export tonnage of rails almost doubled in January over the previous month, but wire rods slumped. Sheets and plates and tin and terne plate all showed marked increases.

The tonnage of steel bars exported in January was a few thousand tons less than in December, 1916, and about the same as in January, 1916. Structural iron and steel fell off in both export and import tonnage as compared with the previous month.

Export Exposition

The first industrial export exposition and conference in the country will be held on the grounds of the Eastern States Exposition, Springfield, Mass., from May 26 to June 2. It is the result of a feeling in the great manufacturing centers of the eastern states and New England that something tangible should be done to fortify the industrial interests to meet conditions that will follow the close of the war in Europe. The exposition has the approval of the United States department of commerce, the Pan-American union and other similar organizations. The department will co-operate by making an extensive exhibition and its experts will take a leading part in the conferences.

The Kentucky Solvay Coke Co. announces the organization of the Ironton Solvay Coke Co., which will build a by-product coke plant at Ironton, O. Of the $2,000,000 authorized capital, $1,600,000 is to be issued.

A joint convention of the Southern Hardware Jobbers' Association and the American Hardware Manufacturers' Association will be held at the Rice hotel, Houston, Tex., April 17, 18, 19 and 20.

Business News of Nation's Capital

Bureau of Foreign and Domestic Commerce Takes Up Plans for Mobilization of Steel and Allied Trades—Labor Supply of Government Yards Uncertain—Higher Rates to Pacific Coast Upheld

Bureau of *The Iron Trade Review*,
708 Metropolitan Bank Bldg.,

WASHINGTON, March 6.—Mobilization of the steel and allied trade has been actively begun. Every effort is being exerted to ascertain what can be done in the way of supplying the government with the required material in the event of war. The work has been taken up by the bureau of foreign and domestic commerce, department of commerce, through the direction of the council of national defense. This is only one branch of the mobilization plan under way, for it embraces all the industries and resources of the country. A centralized system has been adopted.

The bureau will select some society or organization representative of the steel and allied trades, including machine shops, foundries, etc. This organization will be asked to name three prominent men who will act as a general committee to have charge of mobilization of these industries. This general committee in turn will select subcommittees of three members each which will take up the matter of making a comprehensive inventory of each branch of the trades. Plants throughout the country will be visited, the character of their output determined and their capacity, and ability to be transformed from a peaceful to a war basis ascertained. As the work proceeds it is expected that added resources connected with the trades will be included in the work. Such questions as those relating to transportation of products, the labor and its nature engaged in the trades, will be carefully studied. The data gathered will be submitted to the general committee and the latter will then turn its information over to the council of national defense. The council working through the general and subcommittees will advise what the government desires where and when it is wanted.

It is probable that the matter of naming the general committee will be determined upon this week, and that thereupon the whole machinery will be started and quickly pressed into service. In some of the industries, particularly the chemical industry, this has already been done. The work of mobilizing the railroads of the country has already been begun by the council, the committees having been named the latter part of last week.

Navy Yards Have Uncertain Labor Supply

Washington, March 6.—Interesting discussion of the provision in the naval bill appropriating $12,000,000 for equipping additional navy yards for the construction of battle craft of all types was indulged in by Senator Wadsworth, of New York, and Senator Weeks, of Massachusetts, shortly before that measure passed the senate last week. This sum is to be available for the navy department in the event satisfactory contracts as to time of delivery and cost of vessels cannot be procured from private builders. Senator Wadsworth pointed out the matter of the government engaged upon a vast scale of constructing its own vessels is a serious one and ought to be given considerable study. The measure, however, was disposed of in two days owing to the short time that existed before the expiration of the sixty-fourth congress.

It was contended by Senator Wadsworth that by building a battleship at each of the several navy yards, with only one set of ways for each yard the result inevitably will be that during a goodly part of the time consumed in the construction of the vessels a large part of the machinery and many skilled mechanics will be idle. He based his statement on the fact that when they have finished a certain portion of the work on the ships there will be nothing else for them to do, and they will be discharged or held on in employment at some kind of work that will not bring any complete value to the government.

"I have never had much faith myself in the economy of governmental construction on a whosesale program," continued Senator Wadsworth. The great advantage a private yard has over a government yard which is building only one battleship, it was asserted, is that the private yard, in addition to building a battleship for the government, is at the same time building merchant vessels and installing machinery for several other ships.

"The mechanics who are needed for battleship purposes," said Senator Wadsworth, "when they have finished their part of the task, can be switched into the other vessels that are upon the ways of the private yards. Thereby the private yard saves money, holds its men, holds its skilled labor. If the government yards do not adopt that same system, they can never compete with private yards, so far as cheapness of construction is concerned."

Senator Wadsworth said there is constant complaint at the Brooklyn yard for this very reason, that the government from time to time employs hundreds and hundreds of skilled mechanics; that it gives them employment for a year or 18 months; that a ship is nearly finished, or within two or three months of completion, and the men are discharged; that there is no more call for these men for work at that yard for five, six or seven months thereafter, and the men scatter and are lost to the government in a large measure. That, it was declared, has held back construction on the ships that have been constructed and has created uncertain labor conditions. The same thing, he said, will result in every yard where this construction work is to be taken up. Senator Wadsworth held that, inasmuch as the government was entering upon this program, it would be best to lay down more than one ways at certain yards, and thought it would be wise to do so at the Brooklyn yard, but was informed that plant is not under immediate contemplation.

Senator Weeks said that he has had constant complaints since he has been in congress from employes at the Boston yard about the irregularity of their employment, not about the wages paid them, but because they are employed one month and laid off the next. The proposed construction, Senator Weeks maintained, should be in such a way that labor will be continually employed, if possible.

The senate was compelled to strike from the bill a provision for a bond issue to cover an appropriation of $115,000,000 to insure expeditious construction of ships. The house refused to adopt the bond issue provision when the bill was before that body. It was determined to arrange for the bond issue through a separate resolution. The bill as passed carried

approximately $416,000,000, the senate making no material changes in the bill as reported by the committee aside from the striking out of the item for $115,000,000.

Ore Rate Decision Held Up

Washington, March 6.—Decision of the case relating to rates, rules and regulations regarding the transportation of iron ore from lower lake ports to consuming points in western Pennsylvania, Ohio, West Virginia and Kentucky will be made public by the interstate commerce commission in the middle or latter part of the present month. The supplemental report is said to have been completed and ready to go to the printer from the office of Commissioner Harlan. When the original report in the case was announced the commission said that the new rates, etc., which might grow out of the hearings would be made effective on April 1 by the filing of tariffs upon statutory notice of 30 days. The commission, however, is said to have found itself physically unable to execute the plan. Hearings involving protests against the tentative tariff schedules filed by the railroads and based upon the original report were so elaborate, it was explained, that the commission could not give them careful study in time to prepare the supplemental report so that the decision could be made effective on April 1 through statutory notice. It is therefore probable that the railroads will be given special permission to file the new tariffs and make them effective upon three or five days' notice, becoming operative April 1. The commission, as well as shippers and railroads, want the case to be definitely decided and the findings made applicable with the opening of navigation on the Great Lakes. If new rates are not made applicable at that time, those now on file will be continued in force till the former are established.

Is Objection Withdrawn?

Washington, March 6.—Information that Ambassador Page at London had advised the navy department through the state department that Great Britain had withdrawn her objection to Hadfield's, Ltd., Sheffield, Eng., filling a contract with this government for 14-inch and 16-inch armor-piercing shells, it is learned, is not of an official character. Secretary Daniels having failed to commit himself on the question as to whether he will proceed to award contracts to Hadfield's, the situation is surrounded with a mysterious air. It has been intimated that the new move has some significance that it has been found desirable not to make public. Naturally, there is a doubt, under these circumstances, that Mr. Daniels will give any order to the English manufacturer, although it is by no means assured that he will not do so. Until it has been officially announced that the objection of Great Britain has been withdrawn there will continue to be a belief that the foreign maker will be given no contract. Part of the shells on which the English concern bid have already been awarded to American makers, and no credence whatever is given in the amazing report that Mr. Daniels will endeavor to cancel the contracts he has placed with domestic producers and give them to Hadfield's.

Revenue Bill Passed

Washington, March 6.—Passing the senate last Wednesday night, the administration revenue bill was signed by President Wilson on Saturday. The measure went through the senate in the precise form that it came to that branch of congress from the house. Administration leaders had offered numerous amendments to the bill in the senate, but withdrew them in order to obviate the necessity of sending it to conference and possibly of seeing it killed.

Upholds Higher Rates

Washington, March 6.—Effective April 2, the interstate commerce commission has rendered a decision justifying proposed increased commodity rates on iron and steel products from Chicago and Pittsburgh and related points to Pacific coast terminals for export. The protests in the case involved almost exclusively the proposed rates on structural steel. The rate on this commodity will be increased from 30c to 40c per 100 pounds from Chicago and from 42c to 45c from Pittsburgh to the coast on material destined to the orient, including points in Japan, China and the Philippine islands. On traffic to Australia the proposed rate on most articles of iron and steel manufacture from Pittsburgh to the Pacific coast is 60c. Protestants maintained that the difference in rates in favor of Chicago should be at least 10c on traffic for the orient, as it is now in connection with domestic rates. The domestic rates are 65c from Chicago and 75c from Pittsburgh, minimum 60,000 pounds.

The rate from Pittsburgh to the orient via New York was stated by the railroads to be approximately 122.6c, made up of 11c to New York, and 111.6c for the steamship service beyond. The ocean rate from the Pacific coast ports is said to be about 90c, which, added to the proposed rate of 45c from Pittsburgh to the Pacific coast ports, would result in a total through charge of 135c. While this rate is about 12.4c higher than the rate from Pittsburgh via New York, the commission points out, the quicker service, reduced war risks, and lower insurance rates which can be had if the traffic moves via the Pacific coast port tends to equalize the rate disadvantage. Chicago, with the proposed rate of 40c, would get a through rate to the orient via the Pacific coast ports of 130c, or 5c less than Pittsburgh would pay via the Pacific coast ports. The through rate from Chicago to the orient via New York was shown to be 132.6c, made up of 21c to New York and 111.6c beyond, based also on the rates in effect at the time of the hearing.

Lawson's Furnaces For Sale

Announcement has been made that the blast furnaces located at Grand Rivers, Ky., have been placed on the market for sale. They are the property of the Simmons family, the head of which is E. C. Simmons, founder of the Simmons Hardware Co., St. Louis. The offering of this property recalls its rather unique history. Thomas W. Lawson, of Boston, erected the furnaces and surrounding buildings about 25 years ago, investing approximately $500,000 in the venture, which was to revolutionize the iron business in the Kentucky district. The office building was erected along unique lines, and was built entirely of selected and highly colored iron ore. All the fixtures were costly, the chandeliers, for instance, being of German silver, of ornate design.

Lawson and his associates lost money on the venture and soon disposed of the property. It was acquired by the Simmons family in the purchase of a 70,000-acre tract of ore and timber lands. The blast furnace was successfully operated for a time, but recently was abandoned, owing to the scarcity of coke and great cost of getting that ingredient to the ovens.

William Yule, of St. Louis, who is agent for the Simmons, says any purchaser would doubtless move the furnace, though it is located in the heart of an ore field. There are two stacks, each 60 by 13½ feet. The blowing engines were made by the Port Richmond Iron Works in 1891, and there are eight Durham cast iron pipe stoves.

Pig Iron Production in United States, 1916

(Compiled by American Iron and Steel Institute)

PRODUCTION OF PIG IRON BY GRADES, 1900–1916.

Years	Basic.	Bessemer.	Foundry.	Malleable.	Forge.	All other.	Total. Gross tons.
1900.	1,072,376	7,979,327	3,376,445	173,413	703,092	394,589	13,789,242
1901.	1,448,850	9,596,793	3,548,718	256,532	639,454	388,007	15,878,354
1902.	2,038,590	10,393,168	3,851,276	311,458	833,093	393,722	17,821,307
1903.	2,040,726	9,989,908	4,409,023	473,781	783,016	312,798	18,009,252
1904.	2,483,104	9,098,659	3,827,229	263,529	550,836	273,676	16,497,033
1905.	4,105,179	12,407,116	4,758,038	635,236	727,817	358,994	22,992,380
1906.	5,018,674	13,840,518	4,773,011	699,701	597,420	377,867	25,307,191
1907.	5,375,219	13,231,620	5,151,209	920,290	683,167	419,856	25,781,361
1908.	4,010,144	7,216,976	3,637,622	414,957	457,164	199,155	15,936,018
1909.	8,250,225	10,557,370	5,322,415	658,048	725,624	281,789	25,795,471
1910.	9,084,608	11,245,642	5,260,447	843,123	564,157	305,590	27,303,567
1911.	8,520,020	9,409,303	4,468,940	612,533	408,841	229,910	23,649,547
1912.	11,417,886	11,664,015	5,073,873	825,643	469,183	276,337	29,726,937
1913.	12,536,693	11,590,113	5,220,343	993,736	324,407	300,860	30,966,152
1914.	9,670,687	7,859,127	4,533,254	671,771	361,651	235,754	23,332,244
1915.	13,093,214	10,523,306	4,864,348	829,921	316,214	289,210	29,916,213
1916.	17,684,087	14,422,457	5,553,644	921,486	348,344	504,779	39,434,797

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

Coke	321	303	85	388	19,347,935	19,496,663	38,844,598
Anthracite*	6	12	8	20	79,591	138,197	217,788
Charcoal	17	18	22	40	191,996	180,415	372,411
Total	344	333	115	448	19,619,522	19,815,275	39,434,797

* Includes mixed anthracite and coke pig iron.

PRODUCTION OF PIG IRON BY STATES, 1912–1916.

States.	1912.	1913.	1914.	1915.	1916.
Mass., Conn	17,366	12,810	6,594	7,802	5,719
New York	1,939,231	2,187,620	1,559,864	2,104,780	2,352,535
New Jersey	36,876				
Pennsylvania	12,552,131	12,954,936	9,733,369	12,790,668	16,506,284
Maryland	219,546	289,930	195,594	251,548	501,452
Virginia	256,167	341,815	271,228	251,346	399,885
Alabama	1,862,681	2,057,911	1,826,929	2,049,453	2,762,885
West Virginia	274,360	315,731	236,393	291,040	554,590
Kentucky	68,760				
Mississippi					
Tennessee	338,238	280,541	216,738	177,729	355,374
Ohio	6,802,493	7,129,525	5,283,426	6,912,962	8,602,895
Illinois	2,887,359	2,927,832	1,847,451	2,447,220	3,922,512
Indiana, Michigan	1,770,628	1,775,883	1,557,355	1,986,778	2,221,708
Wisconsin, Minn	303,370	367,326	329,526	372,966	811,325
Mo., Ia., Col., Wash., Cal.	397,731	324,263	267,777	271,921	437,633
Total	29,726,937	30,966,152	23,332,244	29,916,213	39,434,797

PRODUCTION OF PIG IRON BY STATES, 1915–1916.

States.	Production—Gross tons.				Increase.	Per cent. increase.
	1916.	Per cent.	1915	Per cent.		
Pennsylvania	16,506,284	41.86	12,790,668	42.75	3,715,616	29.05
Ohio	8,602,895	21.81	6,912,962	23.11	1,689,933	24.45
Illinois	3,922,512	9.95	2,447,220	8.18	1,475,292	60.28
New York, New Jersey	2,352,535	5.97	2,104,780	7.04	247,755	11.77
Alabama	2,762,885	7 01	2,049,453	6.85	713,432	34.81
Ind., Mich	2,221,708	5.63	1,986,778	6.64	234,930	11.82
Wis., Minn	811,325	2.06	372,966	1.25	438,359	117.53
W. Va., Ky.	554,590	1.41	291,040	.97	263,550	90.55
Mo., Ia., Col., Wash., Cal.	437,633	1.11	271,921	.91	165,712	60.94
Maryland	501,452	1.27	251,548	.84	249,904	99.35
Virginia	399,885	1.01	251,346	.84	148,539	59.10
Tennessee	355,374	.90	177,729	.59	177,645	99.95
Mass., Conn	5,719	.01	7,802	.03	2,083*	26.70*
Total	39,434,797	100.00	29,916,213	100.00	9,518,584	31.82

* Decrease.

PRODUCTION OF COLD AND HOT AND WARM BLAST CHARCOAL PIG IRON, 1912–1916.

Kinds of iron.	1912.	1913.	1914.	1915	1916.
Cold blast	8,864	10,222	9,294	5,302	5,323
Hot and warm blast*	338,161	329,759	254,630	290,850	367,088
Total.....Gross tons	347,025	339,981	263,924	296,152	372,411

* Includes iron made with charcoal and electricity from 1912 to 1915, inclusive.

PRODUCTION OF PIG IRON BY GRADES, 1915–1916, SHOWING INCREASE OR DECREASE BY GRADES.

Grades.	1916.	Per cent.	1915.	Per cent.	Increase.	Per cent.
Basic	17,684,087	44.85	13,093,214	43.77	4,590,873	35.06
Bessemer	14,422,457	36.57	10,523,306	35.17	3,899,151	37.05
Foundry	5,553,644	14.08	4,843,899	16.19	709,745	14.65
Malleable	921,486	2.34	829,921	2.77	91,565	11.03
Forge	348,344	.88	316,214	1.06	32,130	10.16
Spiegeleisen	194,002	.49	97,885	.33	96,117	98.19
Ferro-manganese	221,532	.56	149,521	.50	72,011	48.16
All other	89,245	.23	62,253	.21	26,992	43.36
Total	39,434,797	100.00	29,916,213	100.00	9,518,584	31.82

PIG IRON MADE FOR SALE BY GRADES IN 1916.

States.	Bessemer.	Basic.	Forge.	Foundry.	Malleable.	All other.	Total. Gross tons.
Mass., Conn				4,719			4,719
N. Y., N. J., Md.	132,111	404,093	9,892	532,102	150,309	21,341	1,249,848
Pennsylvania	1,103,555	741,524	32,677	965,907	111,404	165,060	3,120,127
Va., W. Va., Ala.		256,549	46,689	1,846,341		27,061	2,176,640
Ky., Tenn.	131,279	1,527	2,954	389,208	12,777	15,357	553,102
Ohio	366,754	793,839	52,403	786,331	273,403	1,357	2,274,087
Ind., Ill.	187,508	218,064		149,354	241,813	20,071	816,810
Mich., Wis., Minn., Mo., Iowa, Col., Wash., Cal.	55,656	61,081		709,234	131,780	10,233	1,057,984
Total	1,976,863	2,476,677	144,615	5,473,196	921,486	260,480	11,253,317

METHODS BY WHICH ALL PIG IRON WAS CAST OR DELIVERED.

States.	Molten condition.	Sand cast.	Machine cast.	Chill cast.	Direct castings.	Total. Gross tons.
Mass., Conn		5,719				5,719
N. Y., N. J., Md.	1,649,644	669,752	420,525	113,320	746	2,853,987
Pennsylvania	10,505,660	1,402,615	3,954,758	634,781	8,470	16,506,284
Va., W. Va., Ala., Ky., Tenn.	1,073,750	2,494,237	212,237	283,540	8,970	4,072,734
Ohio	4,872,296	1,346,970	2,029,774	346,127	7,728	8,602,895
Ind., Ill., Mich., Col., Wis., Minn., Mo., Ia., Wash., Cal.	4,999,668	664,859	1,661,063	64,808	2,780	7,393,178
Total	23,101,018	6,584,152	8,278,357	1,442,576	28,694	39,434,797

METHODS BY WHICH BASIC PIG IRON WAS CAST OR DELIVERED IN 1916.

States.	Sand cast, machine cast, chill cast, etc.	Molten condition.	Total. Gross tons.
New York, New Jersey	305,358	900,482	1,205,840
Pennsylvania	2,325,600	7,058,670	9,384,270
Alabama, Virginia, Kentucky	315,379	872,531	1,187,910
Ohio	947,395	1,509,481	2,456,876
Indiana, Ill., Mich., Wis., Minn., Mo., Col.	541,845	2,907,346	3,449,191
Total	4,435,577	13,248,510	17,684,087

METHODS BY WHICH BESSEMER AND LOW-PHOSPHORUS PIG IRON WAS CAST OR DELIVERED IN 1916.

States.	Sand cast, machine cast, chill cast, etc.	Molten condition.	Total. Gross tons.
New York, Maryland	172,853	749,162	922,015
Pennsylvania	2,089,462	3,443,545	5,533,007
West Virginia, Kentucky, Tenn., Ala.	295,369	201,219	496,588
Ohio	1,570,993	3,362,238	4,933,231
Illinois, Wisconsin, Colorado	459,917	2,077,699	2,537,616
Total	4,588,594	9,833,863	14,422,457

Output Restricted

Severe Weather Affects Iron and Steel Industry in England

Bureau of *The Iron Trade Review*,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Feb. 10, 1917.

The attention of industrial England is divided between the submarine situation with its American complications, and the severe weather, said to be the coldest in 22 years.

The frost has compelled attention, especially in the midlands which are much more dependent than the north of England upon canal communications. Some furnaces receive their coal entirely in 25-ton to 30-ton barges, brought direct from the colleries. Around Birmingham, the large quantity of hot water discharged into the canals from the works has prevented freezing, but 10 miles out of the city the situation is entirely different, and the most vigorous use of ice boats has not prevented the freezing of large stretches of water, and the consequent stoppage of fuel supplies. Some barges have been so knocked about by the rough ice that they have developed extensive leaks, and are now at the bottom of the canal. Some of the blast furnaces in the midlands are on slack blast and a continuance of the frost must compel their temporary shutdown. Already, the output has been greatly decreased. Indirectly, those furnaces fed by means of railway have been affected, because it has been necessary for furnaces and factories hitherto served by the canals to revert to railway traffic, wherever it has been found possible.

The shortage has been partly counteracted by increased supplies of iron in the north of England due to some increase in the producing furnaces. The committee allocating supplies has found it possible to allot somewhat larger quantities, much to the satisfaction of consumers, although the latter are still asking for more. Shipments are rather below the average. Stocks are practically unchanged, but as they amount to less than 3,000 tons, they might as well disappear altogether. Scotland is still a good buyer from Cleveland, especially of foundry iron, and a certain amount of this better class material is also finding its way to the midlands, where supplies are quite insufficient. The midland smelters report very good sales, and in many cases they refuse contracts for extended deliveries. There is very heavy buying in this district of high-class foundry material, especially for steel works castings. Every brand of pig iron is now realizing full maximum prices, in accordance with the scale of the ministry of munitions. There is an excellent demand for hematites of all classes, sales running well into the second half of the year. Prices for home and export continues on the basis recently quoted. Some smelters take the precaution, in making contracts, to insert a proviso guaranteeing the adoption of any advance in standard prices. But this appears to be a somewhat distant contingency, as no application is being made to the ministry of munitions for any alterations of the scales, makers being disposed to leave undisturbed present prices and disinclined to set in motion machinery likely enough to operate against them, when it begins to move. There is great concern also lest wages should further advance, in view of the difficulties in management arising from the excessive earnings of the men.

The finished iron works are suffering from the frost to a greater extent than the furnaces. As the making of pig iron is continuous, naturally the blast furnaces get a certain amount of preferential consideration. The case is different with the finished iron works, which start up from week to week. Many of them have been idle this week through inability to get coal. Some of them have been kept partially operating by cartage supplies, but through the district the output has been greatly reduced and at the moment there is no prospect of improvement. For the time being, the pressure upon iron works to release recruits has been relaxed, the authorities having realized that the production of so essential an article as steel must be relieved from any obstacle arising from labor scarcity. So far the substitutes sent into the iron works have been very unsatisfactory, and it is very likely that the ironmasters will be allowed to have their way in the maintenance of their working staffs.

Publishers Consolidate

The McGraw Publishing Co., Inc., and the Hill Publishing Co., New York, have been consolidated as the McGraw-Hill Publishing Co., Inc. The new company acquires all the properties and interests of the two constituents, including the following technical journals: *Electrical World, Electrical Railway Journal, Electrical Merchandising, Engineering Record, Metallurgical and Chemical Engineering, The Contractor, American Machinist, Power, Engineering News, Engineering and Mining Journal,* and *Coal Age.* Two of these papers, *Engineering News* and *Engineering Record,* will be consolidated under the name *Engineering News-Record,* with Charles Whiting Baker, now editor of *Engineering News,* as editor-in-chief. James H. McGraw will be president of the new company; Arthur J. Baldwin, vice president and treasurer, and E. J. Mehren, vice president and general manager.

Organize New Society

American Institute of Weights and Measures to Oppose Metric System

A number of men who do not favor the use of the metric system as a standard of weights and measures have formed an association for the purpose of opposing the plan to make the European system standard in the United States. The organization is known as the American Institute of Weights and Measures and enrolls as its founders a number of prominent manufacturers and professional men.

The objects of the institute are declared to include the maintenance and improvement of the present English system of weights and measures, the education of the people with respect of the importance of weights and measures, the improvement of old and development of additional standards as they may be needed, the promotion of wise legislation for the conservation of basic English units of weights and measures and additional opposition to hasty and ill-considered legislation involving changes from fundamental English standards.

The organization of the institute was effected under the leadership of Henry D. Sharpe. The members of the council are: John F. Farrel, superintendent of weights and measures state of New York; Fred A. Geier, president, Cincinnati Milling Machine Co.; E. M. Herr, president, the Westinghouse Electric & Mfg. Co.; Alexander C. Humphreys, president, the Stevens Institute of Technology; W. R. Ingalls, editor, *Engineering and Mining Journal;* D. H. Kelly, secretary, Toledo Scale Co.; Henry M. Leland, president, Cadillac Motor Car Co.; William Lodge, president, Lodge & Shipley Machine Tool Co.; Walter M. McFarland, Babcock & Wilcox Co.; Henry D. Sharpe, treasurer, Brown & Sharpe Mfg. Co.; Stevenson Taylor, president, American Bureau of Shipping and Institute of Naval Architects and Marine Engineers; Charles N. Thorn, president, the Inter-Continental Machinery Corporation; Henry R. Towne, chairman of the board of the Yale & Towne Mfg. Co.; W. H. Van Dervoort, president, the Root & Van Dervoort Engineering Co.; and Worchester R. Warner, vice president, Warner & Swasey Co.

The following officers were elected at a meeting of the council at the Engineers' Club, New York, Feb. 19: President, W. R. Ingalls; vice presidents, Henry D. Sharpe and D. H. Kelly; treasurer, Walter M. McFarland; commissioner and secretary, F. A. Halsey.

MEN OF THE IRON TRADE

Who they are Where they are What they are doing

WILLIAM L. HOFFMAN, who has been made district manager of sales and has been commissioned by the Brier Hill Steel Co., Youngstown, to open an office at Philadelphia, for that company, has had an extended experience both in the manufacturing and selling of iron and steel products. His career largely has been identified with eastern territory.

He began his business life with the Tidewater Steel Co., Chester, in 1900. For three years he served as open hearth superintendent of that plant. He then joined the selling organization of the Tennessee Coal, Iron & Railroad Co. and handled its brands of pig iron extensively throughout the east. This connection covered a period of five years, when he became resident manager at Philadelphia for Hickman, Williams & Co. He resigned from this latter position March 1, to take up his new duties with the Brier Hill Steel Co. Mr. Hoffman has a large acquaintance in iron and steel trade circles in the east.

W. S. Pilling, of Pilling & Crane, Philadelphia, has gone to the Pacific coast to spend several weeks.

H. T. Morris has been made superintendent of the projectile department of the Bethlehem Steel Co., South Bethlehem, Pa.

James McNaughton, formerly vice president of the American Locomotive Co., has been made assistant to the president of the Eddystone Munition Corporation, Eddystone, Pa.

Palmer C. Collins, assistant superintendent of the south works of the American Steel & Wire Co., Worcester, Mass., has severed his connection with the company.

Frank A. Smiley has been appointed sales manager of the Pittsburgh Steel Stamp Co., Pittsburgh. The company recently has doubled its floor space to provide additional capacity.

Albert L. Lobb has retired as superintendent of the Richard mine of the Thomas Iron Co., Wharton, N. J., and has been succeeded by Lawrence H. Stone, who has been serving as his assistant.

John J. Haslett is in charge of an office recently opened by the National Fuel Co., Pittsburgh, at 736 Widener building, Philadelphia. Mr. Haslett for a number of years was identified with the Henderson Coal Co., Pittsburgh. Aside from the Philadelphia office, the National company has an office at No. 1 Broadway, New York.

Albert J. Leschorn, for many years connected with the Carnegie Steel Co. and more recently associated with the Phoenix Bridge Co., as a bridge engineer, died recently in Erie, Pa. He was 70 years old.

R. H. Sheriden, president of the Allied Machinery Co. of America, 120

WILLIAM L. HOFFMAN

Broadway, New York, left March 2 for a business trip to Spain and France. He will be away for two months or more.

Frederick N. Manross, president of the Manross Spring Co., Forestville, Conn., has been elected president of the National Marine Lamp Co., Bristol, Conn., to succeed Frederick Perkins, resigned.

Herbert M. Ramp, formerly president of the Elmwood Castings Co., Cincinnati, has become associated with the Bay View Foundry Co., Sandusky, O., in the capacity of foundry manager. The change was effective March 1.

Edward S. Church, engineer, has been chosen president of the Wellman-Seaver-Morgan Co., Cleveland. Mr. Church recently has been associated with Frank A. Vanderlip and previously was with the International Harvester interests. The company plans to increase its manufacturing operations to effect bulk output.

J. Edward Burns Jr., of the Bennett Steel Co., Elmwood, Conn., has resigned to go to Chicago to take charge of the western division of the E. F. Houghton Co., Philadelphia, maker of oils and hardening compositions.

H. T. Dunn, Toledo, O., who has been re-elected president of the Fisk Rubber Co., Chicopee, Mass., has resigned as vice president of the Willys-Overland Co., Toledo, in order to give more of his time to the former company.

Grayson M. P. Murphy, vice president of the Guaranty Trust Co., New York, has been elected a director of the Bethlehem Steel Corporation, succeeding Wm. M. Barnum, resigned. W. F. Hartman, assistant treasurer of the Bethlehem Steel Co., has been elected a vice president of the Bethlehem Steel Corporation.

John C. Jay Jr., who was formerly vice president and general manager of sales of the Pennsylvania Steel Co. and who recently resigned as chairman of the Maxwell Motor Co., has become a member of a firm of consulting engineers in New York which now is known as Jamieson, Houston, Graham & Jay.

Harris Whittemore, Naugatuck, Conn., president of the Eastern Malleable Iron Co., and the J. H. Whittemore Co., and a director of Landers, Frary & Clark and the American Brass Co., has been elected a director of the American Hardware Corporation to fill the vacancy caused by the death of Charles Miller.

Ferdinand W. Roebling, secretary and treasurer of the John A. Roebling Sons Co., Trenton, was a guest of honor Feb. 28 at a dinner tendered him by his associates at the Lotus club in Trenton on the occasion of his seventy-fifth birthday. Many prominent New Jersey state officials were in attendance.

The corporate name of Slater, Marsden & Whittemore Co., Beloit, Wis., manufacturers of punches, shears and wood-working machinery, has been changed to Hendley & Whittemore Co. The change in the name of the company does not indicate any change in its management. In 1913 Mr. Hendley purchased the in-

MEN OF THE IRON TRADE

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terests of Messrs. Slater and Marsden and assumed management of the company at that time, Mr. Whittemore retaining his interest and connection with the company as in the past.

Col. Charles B. Wheeler, U. S. A., who for more than nine years has been commandant of the Watertown arsenal, Watertown, Mass., has been transferred to Washington to become assistant to the chief of the bureau of ordnance at the war department. Col. T. C. Dickson is the new commandant.

Mr. O. M. Stowe, treasurer and purchasing agent of the D. M. Sechler Implement & Carriage Co., Moline, Ill., has severed his connections with the said company. Mr. Stowe has been in their service 10 years; eight years having had charge of collections and finances, and the past two years being purchasing agent. Mr. Stowe's plans for the future have not been decided on.

B. B. Dumville, who was an inspector of the Gatun lock gates of the Panama canal and later was connected with the McClintic-Marshall Co. on the installation of tunnel shields at New York, has signed a contract with the Japanese government to install gates and operating machinery at the entrance of the harbor of Chemulpo, Korea. These lock gates are being furnished by the McClintic-Marshall Co.

Lawrence J. O'Laughlin, formerly one of the blast furnace engineers with the Cambria Steel Co., Johnstown, Pa., has been made chief furnace engineer of the Wharton Steel Co., Wharton, N. J. J. H. Gledhill has taken his position as assistant to F. B. Dutton, general superintendent of the company. He was formerly connected with the Worth Bros. Co., the West End Furnace Co., and with other companies.

John Wheeldon, superintendent of the south works of the American Steel & Wire Co., Worcester, Mass., has resigned after 27 years service with the company to become a director and manager of an independent steel company being organized in Ohio which will have its headquarters in Cleveland. The identitiy of the new company has not been divulged. Mr. Wheeldon had been at the south works for the second time since last June, coming from the Cuyahoga works, Cleveland, to succeed John F. Tinsley, who resigned to go with the Crompton & Knowles loom works in Worcester. Previous to that time Mr. Wheeldon had been superintendent of the north works in Worcester and also the New Haven, Conn., works. He will be succeeded as superintendent of the south works by J. Lester Perry, assistant superintendent of the north works. Peter Stewart will succeed Palmer Collins as assistant superintendent. George A. Green has been made assistant superintendent of the north works.

D. V. Sawhill, identified with the Pittsburgh sales office of the Youngstown Sheet & Tube Co., Youngstown, has resigned to take charge of the sales of tubular products for the Cincinnati Iron & Steel Co., Cincinnati, where he will go about April 1. Mr. Sawhill has been associated with the Youngstown company for about six years. He has been succeeded by George E. Price, who has been connected with the Pittsburgh office of the Youngstown company for several years.

E. Howard Reed, vice president of the Reed & Prince Mfg. Co., Worcester, Mass., has enlisted for three months' service as an executive at the United States torpedo station, Newport, R. I., with the rank of a lieutenant commander in the United States naval reserve, thereby releasing one or more officers for active sea duty. Mr. Reed, who is rated in class 4, composed of experienced manufacturers, will be attached to the torpedo-making branch of the station.

James H. Hustis, president and temporary receiver of the Boston & Maine Railroad Co., has been authorized by Judge James M. Morton, in the United States district court in Boston, to contract for $2,071,000 worth of rails for 1918. It is said that this large order is necessary to put the road in good condition.

Lawford H. Fry, of the Standard Steel Works, Burnham, Pa., gave an illustrated lecture before the Mining Society of the Pennsylvania State College, Wednesday, Feb. 28. The meeting was attended by the faculty and students of the engineering schools. Mr. Fry discussed the subject "Steel, Some of Its Constituents and Some of Its Properties". He emphasized the importance of heat treatment and showed slides of the heat-treating plant at Burnham. The effect of heat treatment on the physical properties and structure of steel was illustrated by slides showing photomicrographs.

J. Leonard Replogle has been made president of the American Vanadium Co., Pittsburgh, succeeding James J. Flannery, who has become chairman of the board of directors. Mr. Replogle has been vice president and general manager of sales. Mr. Replogle has been constantly adding to his executive connections with important companies identified with the iron and steel industry. Recently, he organized and became chairman of the board of the Wharton Steel Co., Wharton, N. J. He is actively interested in the Sun Ship Building Co., Chester, Pa., a comparatively new corporation, and in other eastern ship building concerns.

Lucius F. Robinson and Ferdinand Richter have become directors of the Billings & Spencer Co., maker of machinists' tools and drop forgings, Hartford, Conn. The directors elected the following officers at the annual meeting last week: C. E. Billings, president, F. C. Billings; vice president and general manager; L. D. Parker, treasurer; E. H. Stocker, secretary; F. H. Stocker, assistant secretary and assistant treasurer. The directors in addition to the two new ones mentioned are C. E. Billings, F. C. Billings, C. M. Spencer, Silas Chapman Jr., L. D. Parker, E. H. Stocker and Fred P. Holt.

Claude C. Ostrom, purchasing agent of the Locomobile Co. of America, with headquarters at Bridgeport, Conn., has resigned and has become associated with the Parish Mfg. Co., of Reading and Detroit, manufacturer of automobile frames. He will be located in Detroit in an executive capacity. Mr. Ostrom in 1904 entered the employ of the Midvale Steel Co. He came to the Locomobile company in 1910 as assistant purchasing agent and later became purchasing agent. J. E. Forgy, assistant purchasing agent of the Locomobile company, has been promoted and made acting purchasing agent, effective Feb. 15. Mr. Forgy previously had been associated with the Dupont Powder Co. and the Charles A. Warner Co.

Iron and Money: Fact and Comment

W. H. Donner Warns of Future Problems Arising From Conditions Growing Out of Present Prosperity—Donner Steel Earns 22 Per Cent on Common Stock

SOUNDING a warning against conditions now growing out of the rush of war time business, W. H. Donner presents an excellent analysis of the trend of the times in the annual report of the company which bears his name. These conditions he cites as follows:

"First.—An expansion in the industry considerably beyond normal requirements. New blast furnaces have been and are being built; old ones enlarged and brought up to the highest point of efficiency. New open-hearth plants have been and are being constructed and additional furnaces added wherever conditions will permit. Abandoned plants have been equipped and put in operation. The year 1916 showed a record increase in the production of steel and many improvements are under way that will require months for completion owing to the delay in securing deliveries of machinery and construction materials, so that the United States will have even greater productive capacity by the end of 1917. The cost of machinery and construction work is now so extravagant and deliveries are so uncertain that few manufacturers will venture to contract for new plants or further extensions on the present inflated basis. As soon as the foreign demand is relieved and the accumulated orders are overtaken, there will be a big overproduction, and a decline in prices will naturally follow.

"Second—Increased costs. Aside from the general wage advances made direct to iron workers, the cost of steel has greatly increased owing to the higher prices of limestone, ore, coal, coke, transportation, etc., nearly all of which can be traced to the general advance in wages throughout this country brought about primarily by the war.

"The necessity for any tariff protection on steel is for the present entirely eliminated, but it should be recalled that in the early part of 1914 steel was sold by American manufacturers practically at cost, due to foreign competition. With this same tariff in effect and the changed labor conditions, the future domestic business will present a very much more serious situation in periods of business depression than ever before confronted us."

The surplus available for dividends on the $2,500,000 preferred stock of the Donner Steel Co. in the year just closed amounted to $696,689, equal to about 28 per cent on that issue. After payment of preferred dividends, the balance for the common stock was equal to about 22 per cent on the $2,500,000 shares of that stock then outstanding. Since Jan. 1, 1917, the capital stock has been increased to $9,000,000 by the issue of $3,500,000 preferred and $500,000 common. The income account as of Dec. 31, 1916, follows:

	1916.
*Total net earnings	$1,166,058
Depreciation	350,242
Net earnings	$815,815
Bond interest	119,126
Net income	$696,689
†Preferred dividend No. 1	149,226
Surplus for year	$547,262

*After deducting all expenses incident to operations, including those for ordinary repairs and maintenance (approximately $293,000) and interest on bonds of subsidiary companies.

†At rate of 7 per cent per annum from respective dates of payment for stock to Dec. 31, 1916.

Steel Shares Reflect Confidence

United States Steel has been a bulwark of strength in the stock market, in the face of the disturbing international developments and the turbulent sessions at Washington. Wall street has displayed strong feelings with regard to the action of the minority senators, but even their failure to support the President appears insufficient to overbalance the general confidence in the business prospects of the country. The steel stocks and the war shares have been strong, while the railroad issues have been neglected. Quotations on a number of iron, steel and industrial stocks at the close of the New York stock exchange, March 3, and net changes for the preceding week follow:

	Close Mar. 3.	Net chg.
American Can	43⅜	+ ⅜
American Can, prfd.	108	+ ⅝
American Car & Fdy.	65⅞	+2⅞
American Locomotive	71	+1¼
American Locomotive, prfd.	103⅞	+ ⅝
American Steel Foundries	61⅝	+ ⅛
Baldwin Locomotive	52½	—3½
Baldwin Locomotive, prfd.	100¾	— ⅛
Bethlehem Steel	130¾	+ ¾
Colorado Fuel & Iron	46¾	+ ¾
Crucible Steel	66⅛	+1⅜
Crucible Steel, prfd.	112½	—1½
General Electric	164	+1¼
Gulf States Steel	111	+3
International Harv. of N. J.	117	+2
Inter. Harv. of N. J., prfd.	115	—2½
International Harv. Corp.	75½	—4½
Internat'l Harv. Corp., prf.	110¾	— ¾
Lackawanna Steel	81	+3
Nat'l Enmlg. & Stmp. Co.	33½	+ ½
Nat'l En. & Stmp. Co., prf.	96	.....
Pressed Steel Car	76¾	— ¾
Pullman Palace Car	160½	— ½
Republic Iron & Steel	78½	+1½
Republic Iron & Steel, prfd.	101½	.....
U. S. C. I. P. & Fdy. Co.	18⅝	— ⅛
United States Steel	108⅛	+3½
United States Steel, prfd.	117⅞	— ⅜
Westinghouse Mfg.	49¾	+ ⅛

Maximum quotations for a number of steel and industrial stocks, not quoted on the New York stock exchange at the close March 2 and Feb. 24, follow:

	Mar. 2.	Feb. 23.
American Radiator	445	445
American Ship Building	62	62½
Cambria Steel	...	102¼
Chicago Pneumatic Tool	68½	70
La Belle Iron Works	86	85
Lake Superior Corp'n	21⅞	22⅞
Stewart-Warner Speed. Co.	85	87½
Warwick Iron & Steel Co.	9¼	9¼
Westinghouse Air Brake	149½	150
Westingh'se Elec. & Mfg. Co.	50	50⅛

Empire Steel & Iron Reports

President Leonard Peckitt of the Empire Steel & Iron Co., Catasauqua, Pa., at the annual meeting of stockholders said that 1916 was the best year the company has experienced since its incorporation in 1900. Three dividends, aggregating 8 per cent, were paid during the year. Net earnings the last four months have been at the rate of $900,000 per annum. President Peckitt's report showed that the net profits for the company for the year ended Dec. 31, 1916, after setting aside $106,241 for depreciation and development were $593,317. The balance sheet of the company as submitted to the stockholders shows current assets of $1,059,921. This includes cash item of $190,008 and accounts and notes receivable of $289,722. Current liabilities amounted to $654,657, of which $548,988 is composed of accounts and notes payable. Profit and loss surplus equals $961,685. The company has $1,254,770 common and $2,500,000 6 per cent preferred stock.

Directors were re-elected as follows: A. H. Brown, J. S. Elveroon, A. A. Fowler, J. W. Fuller, D. B.

Meacham, Leonard Peckitt, E. O. Stanley, W. A. Wilbur and C. H. Zelinder.

Financial Crop Ends

The Carbon Steel Co., Pittsburgh, will pay off in full $700,000 worth of 20-year 6 per cent first and second mortgage bonds falling due April 1 upon presentation at the Bankers Trust Co. or the American Exchange National Bank, both in New York, or the Western National Bank of Pittsburgh.

* * *

Reports from Conshohocken, Pa., state that the J. Wood & Bros. Co., capitalized at $400,000, has been taken over by the Alan Wood Iron & Steel Co., Philadelphia. This deal has been under way for several weeks. The J. Wood & Bros. Co. is a manufacturer of sheets and light plates. It has had an historic career.

* * *

Active control of the Acme Steel & Malleable Iron Works Co., Buffalo, has been relinquished by Edward G. Felthousen, its president for many years; D. J. Carson, former manager of the American Malleable Co., has been elected president, and the capital stock has been increased from $100,000 to $400,000.

* * *

A special dividend of 80 per cent, amounting to $1,600,000, has been declared by the Wagner Electric Mfg. Co., St. Louis, a converted munitions plant, in addition to the regular dividend of 2 per cent. An increase of the capital stock from $2,000,000 to $5,000,000 has been authorized and the stockholders have been given the choice of taking their dividend in stock at par value or cash.

* * *

The Whitaker-Glessner Co. has absorbed the Wheeling Corrugating Co., both of Wheeling, W. Va. The former concern has owned virtually all the capital stock of the latter company, which, however, has been operated as a separate unit. After March 15, the two concerns will be operated as one. The Wheeling Corrugating Co. will discontinue business as a corporation and surrender its charter to the secretary of state.

* * *

Plans for taking over the plants and assets of the Standard Roller Bearing Co., Philadelphia, and the Rockwell-Drake Co., Fairfield, Conn., are being matured by the Marlin Arms Corporation. On March 13 the stockholders will vote on a proposal to acquire these two companies for a cash payment of $2,270,000 and 3,350 shares of common stock of the Marlin company. Both of the plants to be acquired are engaged in the manufacture of roller and ball bearings, which, it is pointed out by President A. F. Rockwell, will assure the Marlin company of an active business when the present large demand for munitions has subsided.

* * *

Control of the Pittsburgh Rivet Co., Pittsburgh, has been purchased by new interests headed by R. W. Anderson, W. J. Reitz and M. A. Herald. Mr. Anderson, who will be president of the new company, was formerly assistant to the late F. H. Eaton, president of the American Car & Foundry Co., and was formerly associated with the Illinois Steel Co., the Colorado Fuel & Iron Co., and the Pittsburgh Steel Co. Messrs. Reitz and Herald have been associated, respectively, with the sales and operating departments of the Pittsburgh Steel Co. Mr. Reitz becomes vice president of the new company and Mr. Herald secretary, treasurer and general manager.

* * *

Stockholders of Milliken Bros., Inc., have voted their approval of the selling contract made by the directors whereby the fabricating steel plant on Staten island is to be transferred to Wallace Downing and associates. The initial payment has been made by the buyers. A second payment is due June 1 and the final one Aug. 1, when title is to be passed. The name Milliken Bros., Inc., is not to be included in the transfer of the property. This company will continue to take fabricated steel business until the conveyance of the plant takes place and has made arrangements to complete in the plant any unfinished contracts which may be on hand when the new owners take possession.

To Export Construction Machinery

The Allied Construction Machinery Corporation is the name of a new concern recently organized as a subsidiary of the American International Corporation, with offices at the headquarters of the parent concern, 120 Broadway, New York. The new company is designed to introduce throughout the world the labor-saving construction machinery which has been so highly developed in this country. This includes concrete mixing and distributing plants, derricks, air compressors, hoisting engines, power shovels, road digging machinery, trench digging machines, light railways and similar products, much of which machinery is not used at present outside of this country. The new concern shortly will establish branches in various countries where the markets are most promising. R. P. Tinsley, secretary and treasurer of the American International Corporation, has been elected president and S. T. Henry, formerly second vice president of the McGraw Publishing Co., has been elected vice president and general manager of the Allied Construction Machinery Corporation. Mr. Henry spent several years reporting on the use of construction machinery in all parts of the United States. For the last few years he has been engaged in plans for merchandising this class of machinery both at home and abroad.

A number of men employed by the Standard Gauge Steel Co., Beaver Falls, Pa., went on a strike, Feb. 27.

Benzol is Stronger

Canada Requisitions Toluol—Solvent Naphtha is Active

New York, March 6.—Stronger conditions are developing steadily in the pure benzol market as new demand is active and free supplies are shrinking. The unrestricted offerings of the Lehigh Coke Co., South Bethlehem, Pa., have increased the marketable quantity. Until this plant recently passed from German control, the sale of its coal tar products was limited to non-military needs. Spot sales of the week exceeded 300,000 gallons. Prices are firm at 55 to 60 cents, per gallon, both for spot and contract. Domestic manufacturers of trinitrotoluol now are putting out some inquiries for toluol. The demand of this character of late has been chiefly from Canada. The amounts now sought apparently cover new export orders or negotiations for trinitrotoluol. The color trade is doing some buying of toluol. The largest sellers have adopted a graduated scale of prices which varies with quantity. Spot prices are from $1.75 to $2, and contract from $1.50 to $1.75, per gallon. Phenol is in an easy condition of prices, especially for spot shipment, as offerings have been more plentiful and new demand is not large. Prices are from 45 to 50 cents, per pound. The inside figure is being shaded, in instances.

Solvent naphtha has been more active. Some 50,000-gallon contracts were made this week. Prices range rather widely, depending on the attractiveness of the business. The supply is large and this underlies the market's weakness.

Foreign governments are showing more interest in sulphate of ammonia as increased attention is being given to the increasing of agricultural yields. The entente governments want liberal quantities. There is other export inquiry. Domestic users keep up their demand for odd lots to fill in but the supply is small. Sellers state higher prices than those quoted can be obtained. The fertilizer manufacturers are expected to make new contracts about May. From present indications, prices will be considerably higher this year than last.

Additional benzol by-product prices may be found on page 600a.

Institute Meeting

New York, March 5.—The American Iron and Steel Institute has decided to hold its twelfth general meeting at the Waldorf-Astoria hotel, New York, May 25 and 26.

War Talk Retards Tool Buying

Week's Purchases Lag Perceptibly as Crisis Looms—Expansion Programs Are Deferred Awaiting Outcome—Plants Held in Readiness for Government Service—Electric Companies Head List of Heavy Buyers

THE volume of business in the machine tool market during the past week has shown a decrease compared with preceding weeks. One reason is the uncertainty as to the situation with respect to the manufacture of war munitions for the United States government. Many contracts for guns, small arms ammunition, shells, uniforms, etc., already have been let by the government, but manufacturers generally consider that this business is only a forerunner of what may be expected to be placed should the United States be forced into actual hostilities. As a result, the tendency now is to postpone purchases and to delay the carrying out of expansion programs which had been adopted by many concerns. Instead, manufacturers are holding themselves in readiness to adapt their plants to government requirements. In the ship building industry, of course, there is less uncertainty, since present indications are that the ship yards not only will continue active in turning out merchant vessels, but that the service of these interests generally will be required in the production of naval vessels which are provided for in the new naval construction program passed by congress last week.

The General Electric Co., which recently has been an exceedingly heavy buyer of machine tools, has put out additional inquiries, but has not made any further purchases. The Newport News Ship Building & Dry Dock Co. has not yet issued the large list of tools on which it made preliminary inquiries a week or two ago, but early action is expected. The Westinghouse Electric & Mfg. Co. is understood to be on the point of closing for at least a portion of the large machine tool requirements of the plant for manufacturing ship and ship building equipment which it is about to build at Essington, Pa. Export demand now is not as active as in previous weeks. One list of at least 100 lathes issued recently by C. H. McCarthy, Inc., 50 Church street, New York, is expected to be closed shortly. This list involves 16, 18 and 24-inch swing lathes, with 6, 8, 10 and 12-foot beds. Included among special requirements for export, probably the most important are those of the Tata Iron & Steel Co., Sakchi, India, which are being purchased by C. P. Perin, 2 Rector street, New York. These requirements include a complete blast furnace and several open hearths, together with the necessary cranes and miscellaneous equipment. Westinghouse, Church, Kerr & Co., 37 Wall street, New York, have issued a list of eight cranes, ranging up to 100 tons in capacity, for installation in the Buffalo, Rochester & Pittsburgh shops at Dubois, Pa., and Salamanca, N. Y. The Midvale Steel & Ordnance Co., Philadelphia, is in the market for a 150-ton ladle crane for its Worth Bros. Co. plant at Coatesville, Pa., and for five cranes for installation at its Nicetown, Philadelphia, plant.

Chicago Dealers Have Their Hands Full

ALTHOUGH some slackening of demand was apparent in Chicago during part of February, probably due to the international crisis, that month produced business at about the same rate as January. A feature of the situation is the absence of large inquiries or sales and the steady demand for single tools and small lots. Railroads apparently have bought all the equipment they need for the present. Deliveries remain much the same although somewhat better movement is being given on shipments. Second hand machinery is being taken readily where new equipment cannot be obtained. Government buying continues and an inquiry is out for machinery for shops at the Mare Island navy yard, California, including two 14-inch bench drills, two double emery bench grinders, two engine lathes and a vertical grinding machine. Some big construction is being planned that will require much equipment. The sanitary district of Chicago has plans ready for a pumping station in the Calumet district which will represent an outlay of $2,000,000 and the People's Gas Light & Coke Co. is preparing to erect an extensive new plant. The Harrison Steel Castings Co., which is to establish a steel foundry at Murphysboro, Ill., will require a 25-ton crane and two 10-ton cranes. The Edward Valve & Mfg. Co., Chicago, has increased its capital from $100,000 to $250,000 The Holdfast Nut & Bolt Co., Chicago, recently formed, has increased its capital to $150,000. Four hotels, two of 11 stories and one 9 stories are being planned for Chicago, and one of 10 stories for East St. Louis. The Winther Motor Truck Co., Kenosha, Wis., a new corporation, has started work on its first unit. The G. G. Bayne Co., Bushnell, Ill., is building an addition; the Warner Gear Co., Muncie, Ind., is building an addition and the A. B. Stove Co., Battle Creek, Mich., will build a machine shop.

Buying of Heavy Equipment Continues in Pittsburgh

HEAVY demand exists for all types of machine tools in the Pittsburgh district. Despite the complicated international situation, dealers say inquiries for domestic delivery have not fallen off. The American Sheet & Tin Plate Co. has bought a large combination motor-driven punch and shear, and the National Tube Co. has closed for a large bar shear for its works at Ellwood City, Pa. The Riter-Conley Mfg. Co., Pittsburgh, is buying punching and shearing equipment for its plant at Fairfield, Md. The W. N. Kratzer Co. has purchased a bender and punch. Hubbard & Co., Pittsburgh, are in the market for a portable motor-driven shear, 440-volt, 3-phase, 60-cycle alternating current. Demand for heavy rolling mill equipment has not fallen off. Builders are unable to promise deliveries in less than six to 12 months.

Cincinnati Builders Are Active

INQUIRIES received by machine tool builders in Cincinnati in February were about equal to those of the same month last year, and in both instances, business was better than in February of any previous year in the history of the market. Another advance in the price of machine tools is expected because of the constantly increasing cost of castings, finished steel products, and labor. No developments of impor-

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¶ In the Power House are gears, pistons, cams, rods and many other parts of machinery, that must be **reliable**—or else the entire city would frequently be in total darkness.

¶ AGATHON STEELS are made for, and have a well known reputation for,

Reliability

A city's lighting plant is only ONE of the hundreds of places of responsibility where AGATHON STEELS can be used to advantage.

AGATHON STEELS are made for the one purpose of preventing breakdowns and shutdowns. They eliminate accidents and encourage confidence.

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"AGATHON" Chrome Nickel "AGATHON" Vanadium
"AGATHON" Chrome Vanadium "AGATHON" Chrome Steel
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"AGATHON" Special Analyses

If you will let us know what you are making we will gladly tell you just which AGATHON STEEL is the one suited for your particular requirements. AGATHON STEELS are specially prepared for the manufacture of *Connecting Rods, Crank Shafts, Pistons, Cams, Gears, Axles, Springs, etc.*

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MASSILLON OHIO

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DETROIT OFFICE—326-27-28 Ford Building, F. Walter Guibert, District Representative.

CLEVELAND OFFICE—Hickox Building, The Hamil-Hickox Co., District Representative.

CHICAGO OFFICE—Room 1511-12—Lytton Building, 14 East Jackson Boulevard, Mr. A. Schaeffer, District Representative.

PHILADELPHIA OFFICE—902 Widener Building, Frank Wallace, District Representative.

J. E. DOCKENDORFF & CO.

20 Broad Street *General Export Agents* New York, N. Y

tance have occurred during the past few days. The Southern Machine Mfg. Co., Cincinnati, is a new company with a capitalization of $20,000. One of the principal stockholders is H. E. Stegman, Cincinnati. The Standard Electric Tool Co., Cincinnati, has increased its capital stock from $15,000 to $40,000 in order to add to its facilities. Equipment will be needed by the Cincinnati Concrete Tile & Gravel Co., which will build a plant 60 x 100 feet. The Warner Gear Co., Muncie, Ind., will build a new factory for the manufacture of automobile parts. Equipment is being purchased by the Hydraulic Press Mfg. Co., Mt. Gilead, O., for a new plant which will consist of erecting shop, forge and structural shop, and machine shop.

Good Inquiries Pending in Cleveland

SOME Cleveland machine tool dealers report a marked falling off of inquiries while others state that the amount of new business which has appeared has been above the average. There is not so great a demand for single-purpose machines but tools for manufacturing plants are finding a ready sale. Milling machines, radial drills, planers, engine lathes and shapers have been purchased freely and there are a number of good inquiries in the local market. The Firestone Tire & Rubber Co., Akron, is understood to have entered the Cleveland market with a heavy list of tools. One of the requirements of this company is said to be for eight large boring mills. The B. F. Goodrich Rubber Co., also of Akron, is believed to be purchasing a number of machine tools from local machinery houses. The B. & M. Machine Co., Akron, is in the market for a number of machines. The Cleveland Automatic Machine Co., Cleveland, has received an order for approximately 500 automatic tools for an eastern concern. The equipment is valued at about $500,000 and is for the Singer Mfg. Co., Elizabeth, N. J. It is stated that these tools are to be used on time-fuse work. Deliveries from builders remain the same, though the traffic situation continues to present a problem to the consignee, whose machines may be delayed in transit from one to six weeks after shipment from the factory. No further price changes have been noted, but one local dealer states that an upward revision may take place within 60 days.

New Construction and Equipment

What it is **Where it is** **Who's doing it**

Among New England Factories

DEXTER, ME. — The Wasseckeag Mills contemplate erecting a brick, 150-foot addition to the present building.

DEXTER, ME.—The Amos Abbott Co. will build a brick, 3-story, 40 x 100-foot addition to its mill.

MANCHESTER, N. H.—The W. H. McElwain Co. will build a brick and concrete fireproof, 5-story, 44 x 375-foot factory.

ATTLEBORO, MASS.—R. Wolfenden & Sons will build a fireproof, 2-story, 40 x 140-foot and a 1-story, 40 x 90-foot additions to their plant.

BOSTON.—The 6-story building at 176-182 South street, occupied by the American Oak Leather Co., was damaged $60,000 by fire.

CHICOPEE, MASS.—Lamb Knitting Machine Co. has let a contract for the erection of a 1-story plant addition.

EASTHAMPTON, MASS.—Paul M. Kruger, Easthampton, and Albert Jacobs, Rochester, N. Y., are planning to establish a foundry near the junction of East and Ferry streets.

FALL RIVER, MASS. — The Read Bros. ship yard at South Somerset, Mass., was damaged to the extent of $150,000 by fire Feb. 17.

FALL RIVER, MASS. — The Annawan Mills will build an 80 x 100-foot storage building.

HOLYOKE, MASS.—G. Haarmann & Co., steel contractors, are planning to build an addition to their shop on Commercial street.

HUDSON, MASS.—The Lapointe Machine Tool Co. has been incorporated with $200,000 capital by John J. Prindiville, Framingham, Mass., president and treasurer, Edward P. Maguire, and C. P. Brown.

LOWELL, MASS.—The Costikyan Carpet Co. will build a brick, mill construction, 50 x 200-foot and 100 x 200-foot plant to cost $350,000.

LYNN, MASS.—The main factory of the Huile Co., maker of oil, was damaged by fire, causing a loss of $20,000.

MATTAPOISETT, MASS.—Chas. S. Mendell is about to erect a manufacturing plant to consist of three buildings.

NEWTON, MASS.—The Stowe & Woodward Co. will build a brick or concrete, 49 x 186-foot plant at 181 Oak street.

SHARON, MASS. — The Bay State Film Co., Boston, is building a terra cotta, 2-story, 37 x 200-foot, with 40 x 40-foot two ells, factory on Norfolk place, Sharon Heights.

SOMERVILLE, MASS.—The Conner Implement Co. has been incorporated as manufacturer with $50,000 capital by Abner R. Conner, Meredith Centre, N. H., president; and George H. Moore, treasurer and clerk.

STOUGHTON, MASS.—The Panther Rubber Co. will build a brick, 2-story, 40 x 140-foot addition to its factory.

WATERTOWN, MASS.—Boudrot & Masse will build a brick, 2-story, 33 x 60-foot building at 404 Main street.

WORCESTER, MASS.—The Worcester Gas Light Co. has let contract for a gas purifier and a generator house to cost $25,000.

WORCESTER, MASS. — The Whitcomb-Blaisdell Machine Tool Co. has let contract for a brick, 1-story, 25 x 100-foot addition to its foundry on Southgate street.

BRIDGEPORT, CONN. — R. E. Parsons Foundry Co. is about to erect an addition to its plant.

BRISTOL, CONN. — The Wallace Barnes Co., maker of small springs, has increased its capital stock from $30,000 to $510,000.

DERBY, CONN.—General Ordnance Co. has let a contract for a 1-story, 60 x 150-foot manufacturing addition.

HARTFORD, CONN.—Harry Krasnow, of the National Iron Works, has purchased a 100 x 250-foot site on Windsor street, where the company plans to erect a 75 x 125-foot manufacturing building, several stories in height.

HARTFORD, CONN.—Hartford Industrial Development Co. has let a contract for the erection of a 4-story, 50 x 317-foot building with a 1-story, 64 x 64-foot wing, to be occupied by the Underwood Computing Machine Co.

MYSTIC, CONN.—At an auction sale of the property of the Holmes Motor Co., West Mystic, a marine railway boat building, and boat storage plant of this concern was sold to Wood & McClure, of City Island, New York, for $26,250. The 1-story machine shop and adjacent tract were sold to Geo. W. Carroll, Norwich.

NEW BRITAIN, CONN. — The Stanley Works have been granted a permit for a brick and concrete, 8-story, 85 x 130-foot, storage building to cost $125,000.

NEW BRITAIN, CONN. — The Stanley Rule & Level Co. has asked the legislature for permission to increase its capital from $2,000,000 to $10,000,000.

NEW BRITAIN, CONN.—The New Britain Machine Co. has had plans made for a mill construction, 2-story addition to its 4-story factory building on Chestnut street, which will be used as an office.

NEW LONDON, CONN.—D. W. Whiton Machine Co. is about to erect a 150 x 200-foot plant addition.

NEW LONDON, CONN. — New London Ship & Engine Co. has let a contract for the

Iron Ore
from our Open Pit Mines

PHYSICAL STRUCTURE
COARSE

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VERY DESIRABLE FOR
MAKING BASIC IRON

Some furnace managers are continually finding themselves in trouble. Others seem to get by, year after year, with hardly a worry. ¶ You will find that the use of our

CRAWFORD ORE
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will keep you free from furnace mixture troubles.

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Complete Analysis

	Dried 212°	Natural
Iron	58.35	50.2451
Phosphorus	.065	.05597
Silica	6.03	5.1924
Manganese	1.00	.8611
Alumina	3.40	2.9277
Lime	.16	.1377
Magnesia	.12	.1033
Sulphur	.031	.0266
Volatile Matter	5.74	4.9427
Moisture	13.89	

GUARANTEE for 1917
Iron, Natural 51.50

erection of a 1-story, 20 x 116-foot plant addition. The company also is about to add an additional story to one of its existing buildings, 60 x 116 feet.

TORRINGTON, CONN.—Bids close March 19 for a brick, 2-story and basement, 114 x 140-foot grammar school of 20 rooms.

WALLINGFORD, CONN.—R. Wallace & Sons Mfg. Co. has let a contract for two additions, four stories, 50 x 100 feet, and 1-story, 90 x 213 feet, respectively.

WATERBURY, CONN. — Plans will be ready to figure about March 10 for a brick, 1-story, 162 x 360-foot car barn to cost $125,000 for the Connecticut Co.

WATERBURY, CONN. — The Ludington Machine Co. has been incorporated with $350,000 capital by F. E. Ludington, E. V. Ludington and H. G. Reynolds.

WATERBURY, CONN.—Plans are being drawn for a brick, fireproof, 3-story and basement, 200 x 200-foot high school to cost $300,000 at Grove and Pine streets, for the city.

WATERBURY, CONN. — Plans will be ready to figure about March 1 for brick, 1-story, 100 x 200-foot, 50 x 100-foot and 50 x 80-foot additions to the plant of the Pilling Brass Co.

WILLIMANTIC, CONN. — Laundry Machine Co., manufacturer of mangles, steam presses, etc., expects to begin work in April on a 2-story, 80 x 150-foot brick manufacturing structure. The company at present occupies a building owned by the Vanderman Mfg. Co.

WINSTED, CONN.—The Lamb Mfg. Co., maker of automobile accessories, will be operated by Arthur O. Lamb, permanent receiver, until all stock on hand is converted into finished products. This, it is expected, will require about four months.

PROVIDENCE, R. I. — The building of Taylor, Symonds & Co., was damaged $200,000 by fire.

PROVIDENCE, R. I.—The Tayco Roller Bearing Co. has been incorporated to make tools and machinery with $500,000 capital by Ralph M. Greelaw, Charles E. Tilley and Edwin J. Tetlow.

WOONSOCKET, R. I. — The Scotia Worsted Mills is building a brick, 3-story, 20 x 107-foot addition to its factory.

WOONSOCKET, R. I.—The United States Rubber Co. has been granted a permit to build a brick, steel and concrete, 3-story, 40 x 154-foot addition to its plant on Fairmount street, to cost $30,000.

Along the Middle Atlantic Seaboard

NEW YORK.—The B. Zaboldt Corporation has been organized with $50,000 capital to manufacture machinery by C. E. Travis, H. W. Allison, B. Seaboldt, 258 Wadsworth avenue.

NEW YORK.—Daniel R. Douglas & Co. has been incorporated with $15,000 capital to manufacture boiler coverings, insulating materials by A. E. and D. R. Douglas, A. P. Sheridan, 136 Liberty street.

NEW YORK.—Ideal Tool & Machine Co. has been incorporated with $10,000 to manufacture engines, boilers, machine shop, foundry, factory supplies and hardware by R. Rudolph, W. Metkiff, E. B. Knowlton, 154 Nassau street.

NEW YORK.—Universal Block Surfacing Machine Corporation has been organized with $250,000 capital to manufacture resurfacing machines, foundry and factory supplies by A. S. Kirschenbaum, R. Guttchen, A. J. Marx, 198 Broadway.

TOTTENVILLE, S. I., N. Y.—The Hilliard Co., manufacturer of precision machine work, is erecting a 2-story, 30 x 54-foot plant addition.

CAMDEN, N. J. — Eavinson & Levering Co. has let a contract for the erection of a 3-story, 82 x 129-foot carbonizing building to cost about $100,000.

JERSEY CITY, N. J.—Art Metal Works has let a contract for the erection of a 1-story, 40 x 50-foot plant addition.

KEARNY, N. J.—The Ford Motor Co. has filed plans for the erection of a dock and building along the Passaic river south of Lincoln highway to cost about $100,000. The building will be four stories and the dock 75 x 1,000 feet.

NEWARK, N. J.—A. E. F. Heath & Son are about to erect a 3-story addition.

NEWARK, N. J.—The Mass & Walstein Chemical Co.'s plant was damaged to the extent of $15,000 by fire, which was caused by picric acid which leaked from storage tanks.

NEWARK, N. J.—Max Damm, 83 Greene street, New York, is having plans drawn by Architect Jordan Green, Essex building, Newark, for a 4-story, 100 x 125-foot factory building.

NEWARK, N. J.—The Loew-Victor Engine Co., which has a plant in Chicago, has taken an option on a site in Frelinghuysen avenue, here, on which it proposes to build a plant which will be devoted to the manufacture of Duesenberg marine gasoline engines.

PATERSON, N. J.—Board of education is having plans drawn by Architect H. B. Crosby for a 36-room school building to cost $275,000.

PERTH AMBOY, N. J.—The American Smelting & Refining Co. has commenced the erection of a 1-story, 97 x 234-foot concrete and corrugated steel building to be used for general manufacturing purposes.

ARDMORE, PA.—A. Atwater Kent, 4937 Stanton avenue, Germantown, Philadelphia, plans to erect a garage to cost $40,000. Seburger & Rabenold, Penn building, Philadelphia, are preparing the plans.

BLACK LICK, PA.—The Marshall Foundry Co. with office at Pittsburgh, plans to erect an addition to its plant, to cost $100,000.

CARNEGIE, PA.—Lodge No. 651, Loyal Order of Moose, plans to erect a 5-story clubhouse, 45 x 100 feet. Alden & Harlow, Farmers Bank building, Pittsburgh, are preparing the plans.

CORAOPOLIS, PA.—County commissioners plan to replace the present bridge between Coraopolis and Neville Island.

CLY, PA.—American Phosphorus Co. in which Chas. W. and Harry Asbury, of the Enterprise Mfg. Co. of Pennsylvania, Third and Dauphin streets, Philadelphia, are interested, will erect a 1-story, 36 x 108-foot addition.

FRANKLIN, PA.—Steele & Williams plan to erect a 2-story commercial garage, 75 x 150 feet, to cost $20,000. S. D. Brady, Franklin Trust building, is preparing the plans.

HAZELTON, PA.—Duplan Silk Co. has let a contract for a 2-story, 60 x 120-foot machine and carpenter shop.

HOMESTEAD, PA.—William E. Walton, 201 Eighth avenue, plans to erect a 3-story hotel, 20 x 110 feet, to cost $15,000. A. G. Wickerham, 601 McClure street, is preparing the plans.

KITTANING, PA.—Kittaning Ceramics Co. has been incorporated with $50,000 capital by H. L. McNees, I. T. Campbell, J. S. Porter, Kittaning; R. S. Carrell, H. L. Kelly, Butler.

McKEES ROCKS, PA.—The Greek Catholic congregation plans to erect a church, to cost $40,000. John H. Phillips, 604 Chartiers street, is preparing the plans.

McKEESPORT, PA.—L. O. O. M. plans to erect a 2-story lodge building, 70 x 140 feet, to cost $35,000. C. R. Moffitt, Masonic building, is preparing the plans.

NORRISTOWN, PA.—Badenhauser Boiler Co., J. P. Badenhauser, 1429 Chestnut street, Philadelphia, is about to erect a 1½-story, 186 x 250-foot plant here.

PHILADELPHIA. — The American Metal Works, Louden street and Stenton avenue, has let a contract to I. T. Shoemaker for the erection of a 2-story, 42 x 113-foot manufacturing building.

PHILADELPHIA.—The Midvale Steel Co. is taking bids on the erection of a 1-story, 65 x 79-foot testing machine shop.

PHILADELPHIA. — Electric Service Supplies Co. has let a contract for a 3-story and basement, 60 x 100-foot manufacturing building.

PHILADELPHIA.—Fire damaged the tool building and carpenter shop of the Philadelphia & Reading railroad to the extent of $20,000.

PHILADELPHIA.—The Philadelphia Gear Works, 1120 Vine street, is expected to let a contract shortly for the erection of a 1-story, 18 x 100-foot plant addition.

READING, PA. — The Reading Casting Co.'s plant was damaged to the extent of $20,000 by fire recently. The loss is covered by insurance.

SHARON, PA. — The Knox Pressed & Welded Steel Co., Farmers Bank building, Pittsburgh, plans to erect an addition, 100 x 500 feet, to its plant at Wheatland, Pa.

WARREN, PA.—The Warren Electric Steel Co., which will be incorporated shortly is receiving bids for plant and equipment, to be used to manufacture electric steel castings. The office is at 101 Liberty street, Warren; R. T. Harris is general manager.

YORK, PA.—The city plans to construct two bridges over Glatfelter's run. C. F. Wallow is city engineer.

WILMINGTON, DEL.—Key Block Paving Co. has been incorporated with $1,500,000 capital to manufacture and sell paving blocks of all kinds by F. D. Buck, George W. Dillman, M. L. Horty, all of Wilmington.

WILMINGTON, DEL. — Central Railway Signal Co. has been incorporated with $1,000,000 capital to manufacture railway signals of all kinds by Herbert E. Latter, Norman P. Coffin, Clement M. Egner, all of Wilmington.

WILMINGTON, DEL. — Walker Foundry & Machine Co. has been incorporated with $100,000 capital to manufacture machinery by W. J. Walker, A. P. Manning, A. F. Hickey, of Pittsburgh, Pa.

NEW CASTLE, DEL.—The Delaware Water Improvement Co. plant was damaged to the extent of $20,000 by fire in its engine and pump and transformer station.

NEW CASTLE, DEL.—It is reported here that the Canadian Car & Foundry Co. will build a plant comprising 38 buildings to replace the plant at Kingsland, N. J., which recently was burned.

Activities in the Central States

ALBANY, N. Y.—Premier Machine Tool Works has been incorporated with $25,000 capital to manufacture steel, iron, other metals and their by-products by G. W. Long, J. J. Fisher, C. A. Simmons, Albany.

ALBANY, N. Y.—Whiteside Mfg. Co. has been incorporated with $30,000 capital to manufacture electrical, chemical and scientific apparatus by O. Sampter, J. A. Anger Jr., and A. J. Sommer, 302 West 103rd street.

BINGHAMPTON, N. Y.—Barnes-Smith & Co., 178 Water street, are having plans drawn by Architect S. O. Lacey, Phelps building, for a 3 or 4-story, 60 x 200-foot manufacturing building.

BROOKLYN.—Diop Metal & Mfg. Co. has been incorporated with $25,000 capital to harden metals by M. and F. Urquidi, A. Mauck, 117 Remsen street, Brooklyn.

BROOKLYN.—Rockwood & Co., 88 Washington avenue, New York, have let a contract for a 7-story, 30 x 100-foot manufacturing building.

BROOKLYN.—Architects Boyle & Prowler, 367 Fulton street, have completed plans for a 1-story, 73 x 80-foot plant for the Century Pump & Machine Co.

BROOKLYN.—Charles A. Hones Co. has been incorporated with $10,000 capital to manufacture furnaces and radiators, by H. W. Jackson, C. J. and C. A. Hones, 96 Milton street, Brooklyn.

BROOKLYN. — The Garrett Foundry Co. has been incorporated with $50,000 capital as founder and machinist, by C. H. Fowler, A. W. Trotter and J. C. Garrett, 43 McDonough street, Brooklyn.

BROOKLYN. — American Can Co., 120 Broadway, New York, has let a contract to the Turner Construction Co., 11 Broadway, New York, for the erection of a 6-story and basement, 200 x 331-foot plant here to cost about $750,000.

BUFFALO, N. Y.—Fire recently caused considerable damage to the plant of the Buffalo Non-Ferrous Casting Mfg. Co.

BUFFALO.—The J. Dold Packing Co., 741 William street, has awarded Metz Bros., 1297 William street, a contract for an addition, to cost $12,000.

BUFFALO.—Rice & Adams plan to erect a 3-story factory, 50 x 150 feet. G. M. Wolfe, 1377 Main street, is preparing the plans.

CORTLAND, N. Y.—C. W. Clark, Parker building, is preparing plans for a 2-story wall paper factory, 36 x 168 feet, to cost $15,000.

FRANKFORT, N. Y.—The Bossert Co. has been incorporated with $1,100,000 capital to manufacture iron and steel products by J. S. Pierce, G. A. Kerman and H. G. Brown, Utica.

HEMPSTEAD, N. Y.—The Stevens Piston Ring Co. has been incorporated with $25,000 capital to manufacture piston rings, etc., by D. Levy, F. Bradley, C. D. Stevens, Freeport.

MILLBROOK, N. Y.—Penn Steel & Iron Co. has been incorporated with $155,000 capital to manufacture steel and iron, and to transport coal, iron, steel, etc., by F. H. Butehorn, G. F. Jebbett and A. E. Morre, 20 Arden street, Manhattan.

MINEVILLE, N. Y.—Witherbee, Sherman & Co., Port Henry, have let a contract for three mine buildings here.

PALMYRA, N. Y.—Garlock Packing Co. has let a contract for a 3-story and basement, 54 x 302-foot manufacturing building.

ROCHESTER, N. Y.—The Henry Likly Co., 330 Lyell avenue, plans to erect a 2-story addition to its factory, 30 x 60 feet.

ROCHESTER, N. Y.—Samuel Cohen, 35 Henry street, plans to erect a 2-story factory, 40 x 120 feet. C. Storrs Barrows, 344 East avenue, is preparing the plans.

ROCHESTER, N. Y.—R. T. French Co., Mustard street, plans to erect a 2-story warehouse, 69 x 197 feet, to cost $20,000. Foote, Headly & Carpenter, 405 Carter building, are preparing the plans.

ROCHESTER, N. Y.—F. B. Rae Oil Co. has been incorporated with $125,000 capital to manufacture paint and gasoline by C. C. McCord, S. J. Kearns and F. B. Rae, 571 Park avenue, Rochester.

ROCHESTER, N. Y.—The Monroe County Savings bank has awarded John B. Pike, 1 Circle street, a contract to erect a 2½-story building 60 x 120 feet, Claude Bragdon, Cutler building, is preparing the plans.

SYRACUSE, N. Y.—The Camillus Cutlery Co. plans to erect additions, to cost about $50,000. M. Mayer is general manager of the company.

SYRACUSE, N. Y.—The board of education has awarded the Phelon Engineering & Construction Co. a contract to erect a high school.

SYRACUSE, N. Y.—The Continental Can Co. plans to erect a 3-story, factory addition, 30 x 70 feet. Gaggin & Gaggin, University building, are preparing the plans.

SYRACUSE, N. Y.—M. L. Oberdorfer, 804 East Water street, has awarded E. K. Fennok, 204 North Beech street, a contract to erect an addition to his brass foundry. Russell & King, 602 Snow building, are preparing the plans.

TROY, N. Y.—H. E. Listman Co. has been incorporated with $100,000 capital to manufacture motor vehicles and accessories by B. Bailey, J. H. Broderick, H. E. Listman, 151 River street, Troy.

UTICA, N. Y.—Loomerson Mfg. Co. has been incorporated with $30,000 capital to manufacture machines and tools by A. J. Emerson, J. M. and C. J. Marrone, 508 Second street, Utica.

WATERTOWN, N. Y.—The International Paper Co.'s plant was damaged to the extent of $100,000 by fire recently.

PITTSBURGH.—The board of trustees of Carnegie Institute plan to erect an addition to Carnegie music hall, to cost about $250,000.

PITTSBURGH, PA.—The Tech Mfg. Co. has been incorporated with a capital stock of $10,000 to manufacture electrical and mechanical specialties.

PITTSBURGH.—N. Malonos has awarded Golden & Crick, 5512 Fifth avenue, a contract to erect a motion picture and office building, to cost $60,000.

PITTSBURGH. — The Bessemer & Lake Erie railroad, Carnegie building, is in the market for an 80-inch driving wheel lathe for its shops at Greenville, Pa.

PITTSBURGH.—The Walker Foundry & Machine Co. has been incorporated with a capital stock of $100,000, to manufacture machinery; by W. J. Walker, A. P. Manning and A. F. Hickey, all of Pittsburgh.

PITTSBURGH.—The Taylor Dun Coal Co., through Charles S. Bygate, H. C. Christy and M. C. Briggs, has made application for a charter in Pennsylvania. The company will become active factors in the coal and coke trade, in March.

AKRON, O.—The Firestone Rubber Co. has filed plans for a 5-story building to be erected near its present plant.

BARBERTON, O. — The Portage Rubber Co. plans to erect additions.

CINCINNATI.—The Buckeye Products Co. plant was damaged to the extent of $50,000 by fire recently.

CINCINNATI. — The Cincinnati Gas & Electric Co. contemplates improvements to cost about $500,000.

CINCINNATI.—The Shott Mfg. Co. has been incorporated with a $60,000 capital to manufacture bed springs. The company is operating a factory on John street.

CINCINNATI.—The H. W. Roos Co. has been incorporated with $100,000 capital to manufacture a self-locking, adjustable shoring device. The company will have temporary quarters at 2824 Stanton avenue. Henry W. Roos, and George W. Meyer, both of Cincinnati, are the principal incorporators.

CLEVELAND. — The Mechanical Rubber Co. has acquired an 80 x 130-foot site near its plant for future growth.

CLEVELAND.—The Enamel Products Co. has applied for a permit to erect a 100 x 100-foot, $15,000 factory.

CLEVELAND.—The River Furnace Co. has acquired an acre on East Forty-ninth street for future plant developments.

CLEVELAND. — The National Bronze & Aluminum Co. has applied for a permit to erect a 41 x 132-foot, $12,000 factory.

CLEVELAND.—Samuel Gurss and others are planning to erect a 106-suite apartment on a 103 x 264-foot site at East Ninetieth street and Euclid avenue.

CLEVELAND.—The Wald Realty Co. has applied for a permit to erect a 2-story reinforced concrete and brick, 114 x 164-foot, factory to cost $65,000. The plans call for a future addition of two more stories.

CLEVELAND.—The Lakewood Engineering Co. has let contracts to the Austin Co. for additions to cost between $40,000 and $50,000. The Austin Co. also has a contract for the $20,000 plant addition to the Empire Brass Co.

DAYTON, O.—The Dayton Time Lock Co. has acquired the plant of the Harrison Adding Machine Co., Columbus. Extensive additions to this plant are contemplated.

DAYTON, O.—F. A. Wagner, president of the American Mechanical Toy Co. states that the plant which was damaged to the extent of $90,000 by fire recently, will be rebuilt immediately.

ELYRIA, O.—A power house and addition costing $85,000 will be built for the Memorial hospital, according to A. F. Allen.

FREMONT, O.—The Lincoln Stove Co. is planning a large addition to its plant. Improvements for the molding department are also contemplated.

MARYSVILLE, O. — The Regent Brass Foundry Co. has been incorporated with $30,000 capital as foundry, by Joseph J. Klein, A. V. Birnbaum, A. J. Hale, S. M. Davis, and E. Weinberger.

MARION, O.—F. E. Guthrie, of the chamber of commerce, states that a branch factory of the Buffalo Machine Shop is planned for this city. The new building will be 2-story, 50 x 150 feet.

MASSILLON, O.—The Reynolds Machine Mfg. Co., Moline, Ill., has been purchased by local capital. The chamber of commerce states that a new factory having 36,000 square feet of floor space will be erected in Moline.

YOUNGSTOWN, O. — The General Fireproofing Co. plans to erect a 4-story plant on Logan avenue.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

Bessemer valley	$35.00 to 36.00
Bessemer, Pittsburgh	35.95 to 36.95
Basic, Pittsburgh	30.95
Basic, eastern Pa.	33.00 to 33.50
Basic, Buffalo	35.00
Malleable, Pittsburgh	35.95 to 38.95
Malleable foundry, Chicago	34.00
Malleable foundry, Philadelphia	37.00 to 38.00
Malleable foundry, Buffalo	35.00
No. 1X foundry, Philadelphia	35.50 to 36.00
No. 2 foundry, Pittsburgh	35.95 to 38.95
No. 2 foundry, Cleveland	35.30 to 38.30
No. 2 foundry, Ironton	35.00
No. 2 foundry, Chicago	34.00
No. 2X foundry, Philadelphia	34.50 to 35.50
No. 2X foundry, N. J. tidewater	34.50 to 35.50
No. 2X foundry, Buffalo	35.00
No. 2 plain, Philadelphia	34.00 to 34.50
No. 2 plain, N. J. tidewater	34.00 to 34.50
No. 2 plain, Buffalo	35.00
No. 2 southern, Birmingham	25.00 to 30.00
No. 2 southern, Cincinnati	27.90 to 32.90
No. 2 southern, Chicago	29.00 to 31.00
No. 2 southern, Phila. delivery	30.00 to 32.00
No. 2 southern, Cleveland	29.00 to 31.00
No. 2 southern, New York docks	29.25 to 30.25
No. 2 southern, Boston docks	30.00 to 32.00
No. 2 south. interior, New Eng.	30.00 to 32.00
No. 2 southern, St. Louis	
Virginia, No. 2X furnace	32.00 to 34.00
Virginia, No. 2X, Philadelphia	34.75 to 36.75
Virginia, No. 2X, Jersey City	35.00 to 37.00
Virginia, 2X, Boston points	35.25 to 37.25
Gray forge, eastern Pa.	31.50 to 32.00
Gray forge, Pittsburgh	31.95 to 32.95
Gray forge, Birmingham	26.00
Silveries, 8 per cent, furnace	40.00
Silveries, 8 per cent, Chicago	42.00
Low phos. Standard, Phila.	60.00 to 62.00
Low phos. Lebanon, Pa., furnace	55.00 to 60.00
Low phos., Pittsburgh	52.00 to 54.00
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	36.75 to 37.75
Charcoal, Buffalo	24.00 to 27.00
Charcoal, Birmingham	27.00 to 28.00

IRON ORE

Lake Superior Ores.	Lower Lake Ports.
Old range Bessemer, 55 per cent, ton	$5.95
Messabi Bessemer, 55 per cent, ton	5.70
Old range non-Bes., 51½ per cent, ton	5.20
Mesabi non-Bess., 51½ per cent, ton	5.05

Port Henry Ores. Per unit delivered eastern Pa. All non-Bessemer.

Old Bed, crude, 58 per cent	10.50c to 11.00c
Old Bed, concent., 65 per cent.	11.00c to 11.50c
Harmony concent., 63 per cent.	11.50c to 11.75c
Lump (at mines)	$5.75

COKE

(At the ovens.)

Connellsville furnace	$10.50 to 11.50
Connellsville furnace, contract	8.00 to 8.25
Connellsville foundry, 2nd half	6.75 to 7.50
Connellsville foundry, 1st half	9.00 to 10.00
Connellsville foundry	12.50 to 13.50
Wise county furnace, contract	7.00 to 9.00
Wise county foundry, contract	7.50 to 11.00
Pocahontas foundry, contract	7.50 to 11.00
Pocahontas furnace, contract	7.00 to 9.00
New River foundry, contract	8.50 to 11.00
New River furnace, contract	7.50 to 9.50

FERRO ALLOYS AND STEEL MAKING METALS

Ferro manganese, 80 per cent, delivered prompt	$250 to 275
Ferro manganese, 80 per cent, seaboard and deliv'd, contract.	185 to 250
Spiegel, 20 per cent furnace by July	75.00 to 80.00
Spiegel, 20 per cent, furnace, last half	60.00 to 65.00
Ferro-silicon, 50 per cent, Pbgh., nominal	175 to 225

Bessemer ferro-silicon, 9 per cent to 10 per cent, $46.00; 10 to 11 per cent, $47.00; 11 to 12 per cent, $48.00; 12 to 13 per cent, $49.00 a ton at the furnace at Ashland, Jackson and New Straitsville, O.

Ferro-carbon titanium, 8 to 12½ cents per pound in carloads.

SEMI-FINISHED MATERIAL

Open hearth billets, Phila.	$65.00
Forging billets, Phila.	85.00 to 90.00
Forging billets, Pbgh., nominal	90.00 to 100.00
Forging billets, Chicago	70.00
Wire rods, Pittsburgh	75.00 to 85.00
Bessemer billets, Youngstown	65.00 to 67.50
Bessemer billets, Pittsburgh	$65.00 to 67.50
Open hearth billets, Pittsburgh	65.00 to 67.50
Open hearth billets, Youngstown	65.00 to 67.50
Bess. sheet bars, Youngstown	65.00 to 67.50
Op. h'th sheet bars, Youngstown	65.00 to 67.50
Bess. sheet bars, Pittsburgh	65.00 to 67.50
Open hearth sheet bars, Pbgh.	65.00 to 67.50
Muck bars, Pittsburgh (nominal)	50.00
Grooved steel skelp	3.25c
Sheared steel skelp	3.75c

RAILS AND TRACK MATERIAL

(Gross tons.)

Stand. Bes. rails, Pbgh. & Chgo.	$38.00
Stan. op-h'th rails, Pbgh. & Chgo.	40.00
Light rails, 8 to 10 lbs., Pbgh.	53.00
Light rails, 8 lb., Chicago	55.00
Light rails, 12 to 14 lbs., Pbgh.	52.00
Light rails, 12 lbs., Chicago	54.00
Light rails, 16 to 20 lbs., Pbgh.	51.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:—

Cleveland	$0.95
Newark, N. J.	2.98
Boston	3.18
Philadelphia	2.78
Pittsburgh	.95
St. Louis	3.18
Minneapolis, St. Paul	4.54
Buffalo to:—	
Albany, N. Y.	$1.26
New England (all rail)	2.58
New York and Brooklyn (all rail)	2.58
New York and Brooklyn (by canal)	1.25 to 1.60
Virginia furnaces to: —	
Boston docks (r. and w.)	$3.05
New England (all rail)	3.25
New York dock (r. and w.)	2.88
Birmingham, Ala., to:—	
Cincinnati	$2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
Minneapolis, St. Paul	5.85
New York (all rail)	6.15
New York (r. and w.)	4.25
Philadelphia (all rail)	5.20
Philadelphia (r. and w.)	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75
Chicago to:—	
Des Moines	$2.80
Milwaukee	.50
Minneapolis, St. Paul	2.00
Moline, Ill.	1.40
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:—	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58
Minneapolis, St. Paul	4.54
Duluth, Minn., to:—	
Minneapolis-St. Paul	$1.25
Mayville, Wis.:—	
Minneapolis-St. Paul	$1.75

Light rails, 16 to 20 lbs., Chgo.	53.00
Light rails, 25 to 45 lbs., Pbgh.	50.00
Light rails, 25 to 45 lbs., Chgo.	52.00
Relaying rails, standard, Pbgh. and Chicago	$33.00 to 34.00
Relaying rails light, Chicago	34.00 to 35.00
Angle bars, st. sect., Pbgh. base	2.25c to 2.75c
Angle bars st. sections, Chgo.	2.25c to 2.75c
Spikes, railroad, Pittsburgh	3.40c
Spikes, railroad, Chicago	3.50c
Track bolts, Pittsburgh	4.50c to 5.00c
Track bolts, Chicago	4.50c to 4.60c
Tie plates, Chicago	$55.00 to 60.00

SHAPES, PLATES AND BARS

Structural shapes, con. Pbgh.	3.25c
Structural shapes, Philadelphia	3.409c to 3.659c
Structural shapes, New York	3.419c to 3.669c
Structural shapes, Chicago	3.44c to 4.00c
Tank plates, Chicago	3.94c to 4.50c
Tank plates, Pittsburgh (con.)	3.75c to 4.00c
Tank plates, Pittsburgh	4.50c to 5.25c
Tank plates, Philadelphia	3.909c to 5.659c
Tank plates, New York	3.919c to 5.669c
Bars, soft steel, Chicago	3.19c to 3.50c
Bars, soft steel, Pittsburgh	3.00c to 3.25c
Bars, soft steel, New York	3.169c to 3.419c
Bars, soft steel, Philadelphia	3.159c to 3.409c
Hoops, carloads, Pbgh. contr.	3.50c
Hoops, Pittsburgh	4.25c to 4.50c
Bands, Pittsburgh	4.10c to 4.35c
Bands, Pittsburgh (contr.)	3.00c
Shafting, Pbgh., contr. carloads	10 to 20 off
Bar iron, Chicago	3.00c
Bar iron, Philadelphia	3.409c
Bar iron, Cleveland	3.00c
Bar iron, New York	3.419c
Bar iron, Pittsburgh	3.25c to 3.50c
Hard steel bars, Chicago	3.00c

SHEETS

(In cents per pound.)

(Open hearth material takes 10c above prices of bessemer.)

SHEET MILL BLACK.

Gage.	Bessemer.
17 to 21	4.55 to 5.55
22 to 24	4.60 to 5.60
25 and 26	4.65 to 5.65
27	4.70 to 5.70
28	4.75 to 5.75
29	4.80 to 5.80
30	4.90 to 5.90

TIN MILL BLACK.

Gage.	Bessemer.
15 and 16	4.55 to 5.55
17 to 21	4.60 to 5.60
22 to 24	4.65 to 5.65
25 to 27	4.70 to 5.70
28	4.75 to 5.75
29 and 30	4.80 to 5.80
30½ and 31	4.85 to 5.85

GALVANIZED.

Gage.	Bessemer.
10 and 11	5.60 to 6.25
12 to 14	5.70 to 6.35
15 and 16	5.85 to 6.50
17 to 21	6.00 to 6.65
22 to 24	6.15 to 6.80
25 and 26	6.30 to 6.95
27	6.35 to 7.10
28	6.60 to 7.25
29	6.80 to 7.45
30	7.00 to 7.65

BLUE ANNEALED.

Gage.	Bessemer.
3 to 8	4.50 to 5.00
9 to 10	4.50 to 5.00
11 to 12	4.50 to 5.00
13 and 14	4.50 to 5.00
15 and 16	4.50 to 5.00

No. 28 black, Chicago	5.19c to 5.44c
No. 28 galvanized, Chicago	6.50c to 6.75c
No. 10 blue annealed, Phila.	4.909c to 5.159c
No. 10 blue annealed, Chicago	4.94c to 5.19c

TIN PLATE

Tin plate, 100 lb., coke base, contract	7.50c to 8.50c
Tin plate, coke base, prompt.	8.25c to 8.75c
Terne plate I. C.	6.00c
Terne plate, long	7.00c to 7.50c

IRON AND STEEL PIPE

(Prices adopted March 5, 1917.)

Steel.

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
⅛, ¼ and ⅜, butt	53	26½
½, butt	57	42½
¾ to 3, butt	60	46½
2, lap	53	40½
2½ to 6, lap	56	43½
7 to 12, lap	53	39½
13 and 14, lap	43½	....
15, lap	41	....

Iron.

(Prices adopted March 5, 1917.)

Standard weight, threads and couplings, diam. in inches.	Black. Per cent off.	Galv. Per cent off.
⅛ and ¼, butt	42	15
⅜, butt	43	16
½, butt	47	29
¾ to 1½, butt	50	34
1¾, lap	35	20
1½, lap	42	28
2, lap	43	29
2½ to 6, lap	45	32
7 to 12, lap	44	31

BOILER TUBES

(Price adopted Nov. 20, 1916.)

Steel, 3½ to 4½ inches, l. c. l.	46
Iron, 3½ to 4½ inches l. c. l.	36

IRON AND STEEL PRICES

Corrected up to Tuesday noon

WIRE PRODUCTS

(Adopted March 5, 1917.)
(Retailers' prices 5 cents above jobbers' quotations.)

Wire nails, jobbers', Pittsburgh	$3.20
Coated nails	3.10 to 3.15
Plain wire, jobbers', Pittsburgh	3.15
Galvanized wire, jobbers', Pbgh	3.85
Polished staples, Pbgh	3.35
Galvanized staples, Pbgh	4.05
Barb wire, painted, jobbers', Pbgh.	3.35
Barb wire, galv., jobbers', Pbgh	4.05

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller or shorter, rolled thread, 40 and 10; cut threads, 40 and 2½, larger or longer, 30 and 5.

Machine bolts with hot pressed nuts ⅜ x 4 inches, smaller or shorter rolled 50; cut, 40 and 10; larger or longer, 35 and 5.

Cold pressed, semi-finished hexagon nuts, 50, 10 and 5.

Gimlet and cone point lag bolts, 50. Hot pressed square nuts, blanks, $2.50 off; tapped $2.30 off. Hot pressed hexagon nuts, blank, $2.50 off; tapped, $2.30 off.

Cold pressed square nuts, blank, $2.10 off; tapped, $1.90 off. Cold pressed hexagon nut, blank, $2.25 off; tapped, $2.00 off.

RIVETS

Structural rivets, Pbgh	4.25c
Boiler rivets, Pbgh	4.35c
Tinner's rivets, 40 and 10 off, Pittsburgh.	

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	3.00c

STANDARD STEEL CHAIN

Chain, ⅜ inch proof coil	6.00c to 6.50c

COLD ROLLED STRIP STEEL

Base price, 7.00c to 8.00c per 100 pounds, hard, coils 1½ inches and wider and by .100 inch and heavier.

CAST IRON WATER PIPE

Four-inch, Chicago	$45.50
Six-inch and larger, Chicago	42.50
Six-inch Class B, New York	41.50
Four-inch Class B, New York	44.50
Four to six-inch Birmingham	40.00
Six-inch and larger, Birmingham	37.50

Light weight water and gas pipe $1 per ton higher than standard water.

WAREHOUSE PRICES

Steel bars, Chicago	3.75c
Steel squares, 2-in. & ov., Cleve.	4.50c
Steel bars, und. 2 in., Cleveland	4.00c
Steel rounds, 2-in. & ov., Cleve.	4.50c
Steel bars, Detroit	3.75c
Steel bars, Philadelphia	4.00c
Steel bars, New York	4.00c
Steel bars, St. Louis	3.80c
Steel bars, Cincinnati	3.90c to 4.45c
Steel bars, St. Paul	3.85c
Steel bars, over 2-in., Buffalo	4.50c
Steel bars, Buffalo	3.85c
Iron bars, Chicago	3.75c
Iron bars, Cleveland	3.95c
Iron bars, Detroit	3.75c
Iron bars, St. Louis	3.75c
Iron bars, Cincinnati	3.80c to 4.35c
Iron bars, Philadelphia	3.75c to 3.85c
Iron bars, New York	3.75c to 3.85c
Shapes, Chicago	4.00c
Shapes, Detroit	4.00c
Shapes, St. Louis	4.05c
Shapes, St. Paul	4.10c
Shapes, New York	4.10c
Shapes, Cleveland	4.10c
Shapes, Philadelphia	4.10c
Shapes, Buffalo	3.95c
Shapes and plates, Cincinnati	4.10c to 5.00c
Plates, Chicago	4.75c
Plates, Detroit	4.75c
Plates, St. Louis	4.80c
Plates, St. Paul	4.85c
Plates, New York	5.15c
Plates, Cleveland	5.00c
Plates, Philadelphia	5.25c
No. 10 blue anl. sheets, Chicago	5.25c
No. 10 blue anl. sheets, Clevel'd	5.00c
No. 10 blue anl. sheets, Buffalo	4.50c
No. 10 blue anl. sheets, St. L.	5.30c
No. 10 blue anl. sheets, Cinci.	5.25c
No. 10 blue anl. sheets, St. Paul	5.35c
No. 10 blue anl. sheets, Detroit	5.25c
No. 28 black sheets, Chicago	5.40c
No. 28 black sheets, Cleveland	5.50c
No. 28 black sheets, Cincinnati	5.50c
No. 28 black sheets, Detroit	5.40c
No. 28 black sheets, St. Louis	5.45c
No. 28 black sheets, St. Paul	5.50c
No. 28 galv. sheets, Chicago	7.50c
No. 28 galv. sheets, Cleveland	7.00c
No. 28 galv. sheets, Cincinnati	7.50c
No. 28 galv. sheets, Detroit	7.50c
No. 28 galv. sheets, St. Louis	8.00c
Hoops, Cleveland	5.00c
Hoops, Detroit	4.50c

Coke Oven By-Products

Spot.

Per Gallon at Producers Plant.

Pure benzol	$0.55 to .60
Toluol	1.75 to 2.00
Solvent naphtha	.18 to .23

Per Pound at Producers Plant.

Phenol	$0.45 to .50

Per 100 Pounds at Seaboard.

Sulphate of ammonia	$4.30 to 4.35

Contract.

Per Gallon at Producers Plant.

Pure benzol	$0.55 to .60
Toluol	1.75
Solvent naphtha	.16 to .20

Per Pound at Producers Plant.

Phenol (nominal)	$0.45 to .50

Per 100 Pounds at Seaboard.

Sulphate of ammonia	no market

IRON AND STEEL SCRAP

(Net Tons.)

Angle bars, iron, Chicago	$27.25 to 27.75
Angle bars, steel, St. Louis	21.50 to 22.00
Arch bars and transoms, St. L.	27.50 to 28.00
Arch bars and transoms, Chgo.	28.00 to 28.50
Cast, No. 1, St. Louis	15.00 to 15.50
Boiler plate, cut, No. 1, Chgo.	13.00 to 13.50
Boiler plate, cut, No. 1, St. L.	13.00 to 13.50
Boiler punchings, Chicago	20.00 to 21.00
Bundled sheet, Cincinnati	12.50 to 13.00
Busheling, No. 1, Chicago	16.50 to 17.00
Busheling, No. 1, Cincinnati	14.00 to 14.50
Busheling, No. 1, Cleveland	18.00 to 18.50
Busheling, No. 1, St. Louis	16.00 to 16.50
Busheling, No. 2, Chicago	12.25 to 12.75
Cast borings, Cincinnati	8.00 to 8.50
Cast borings, Cleveland	9.00 to 9.25
Cast borings, St. Louis	8.50 to 9.00
Cast borings, Chicago	9.25 to 9.75
Cast, No. 1, Chgo	16.00 to 16.50
Cast, No. 1, Cincinnati	16.00 to 16.50
Cast, No. 1, Cleveland	18.25to 18.50
Cast, No. 1, St. Louis	15.00 to 15.50

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 lbs. to:—

New York	16.9 cents
Philadelphia	15.9 cents
Boston	18.9 cents
Buffalo	11.6 cents
Baltimore	15.4 cents
Cleveland	10.5 cents
Cincinnati	15.8 cents
Chicago	18.9 cents
Detroit	15.7 cents
Minneapolis and St. Paul	32.9 cents
Denver	83.6 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast (all rail)	73.9 cents
Pacific coast (tin plate)	70 cents
Pacific coast, via Panama canal	61.9 cents

Cut forge, Chicago	23.75 to 24.25
Grate bars, Cleveland	13.00 to 13.25
Iron axles, St. Louis	34.00 to 34.50
Iron axles, Cleveland	43.00 to 44.00
Knuckles, coup., Chicago	23.00 to 23.50
Knuckles, coup., St. Louis	24.00 to 24.50
Locomotive tires, Chicago	32.50 to 33.00
Locomotive tires, St. Louis	31.00 to 31.50
Machine shop turnings, Chicago	9.00 to 9.50
Machine shop turnings, Cleveland	9.00 to 9.25
Machine shop turn'gs, Cincinnati	8.00 to 8.50
Machine shop turn'gs, St. Louis	9.25 to 9.75
Malleable agricultural, Chgo.	14.50 to 15.00
Malleable agricultural, St. Louis	15.50 to 16.00
Malleable, Cincinnati	12.50 to 13.00
Malleable railroad, Chicago	17.50 to 18.00
Malleable railroad, St. Louis	16.00 to 16.50
Pipes and flues, Cleveland	14.75 to 15.25
Pipes and flues, Chicago	14.00 to 14.50
Pipes and flues, St. Louis	14.50 to 15.00
Railroad wrought, No. 1, Cleve.	25.00 to 25.50
Railroad wrought, No. 1, Chgo.	25.00 to 26.00
Railroad wrought, No. 1, Cinci.	19.00 to 20.00
Railroad wrought, No. 1, St. L.	25.00 to 25.50
Railroad wrought, No. 2, Chgo.	24.00 to 24.50
Railroad wrought, No. 2, St. L.	24.00 to 24.50
Shafting, St. Louis	24.50 to 25.00
Springs, Chicago	23.50 to 24.00
Steel car axles, St. Louis	35.00 to 35.50
Steel car axles, Chgo.	35.00 to 36.00
Stove plate, Chicago	12.00 to 12.50
Stove plate, Cleveland	12.25 to 13.00
Stove plate, Cincinnati	10.50 to 11.00
Stove plate, St. Louis	11.50 to 12.00

(Gross Tons.)

Axle turnings, Cleveland	$16.50 to 16.75
Axle turnings, Buffalo	17.50 to 18.00
Busheling, No. 1, Buffalo	20.50 to 21.50
Busheling, No. 1, Pittsburgh	16.50 to 17.25
Busheling, No. 2, Buffalo	13.00 to 13.50
Bundled sheets, Pittsburgh	15.00 to 16.00
Bundled sheets, Cleveland	14.50 to 15.00
Bundled sheets, Buffalo	14.00 to 14.50
Bundled tin, Buffalo	13.50 to 14.00
Car wheels, (iron), Pittsburgh	22.50 to 23.00
Car wheels, (steel), Pittsburgh	27.00 to 28.00
Car wheels, Chicago	19.50 to 20.00
Car wheels, eastern Pa	20.50 to 21.50
Car wheels, Buffalo	23.00 to 23.50
Car wheels, New York	19.00 to 20.00
Car wheels, St. Louis	19.00 to 19.50
Car wheels, Birmingham	15.00 to 15.50
Car wheels, Cleveland	19.50 to 20.00
Tram car wheels, Birmingham	14.50 to 15.00
Cast borings, New York	12.00 to 12.50
Cast borings, eastern Pa	14.00 to 14.50
Cast borings, Buffalo	11.00 to 11.50
Cast borings, Pittsburgh	12.00 to 12.50
Cast, No. 1, eastern Pa	21.00 to 22.00
Cast, No. 1, Pittsburgh	22.00 to 22.50
Cast, No. 1, Birmingham	16.00 to 17.00
Cast, heavy, No. 1, N. J. points	20.50 to 21.00
Forge flash'gs, un. 10 in., Cleve.	19.50
Forge flash'gs, ov. 10 in., Cleve.	17.00
Forge, No. 1, eastern Pa	16.00 to 16.50
Frogs, switches, guards, St. L.	22.50 to 23.00
Grate bars, Buffalo	15.00 to 15.50
Grate bars, N. J. points	13.50 to 14.00
Heavy axle turnings, Buffalo	16.00 to 16.50
Heavy melting steel, Pittsburgh	22.50 to 23.50
Heavy melting steel, Buffalo	25.50 to 26.50
Heavy melting steel, Chgo	22.00 to 22.50
Heavy melting steel, Cleveland	22.75 to 23.25
Heavy melting steel, Cincinnati	19.50 to 21.00
Heavy melting steel, eastern Pa	22.00 to 23.00
Heavy melting steel, New York	20.00 to 21.00
Heavy melting steel, St. L	23.00 to 24.00
Heavy melting steel, Birmingham	15.00 to 16.00
Hydraulic pressed sheet, Clevel'd	18.50 to 19.00
Hydraulic pressed sheets, Pbgh	18.50 to 19.00
Hydraulic pressed sheets, Chgo	14.50 to 15.00
Iron rails, Chicago	28.00 to 28.50
Iron rails, Buffalo	25.00 to 26.00
Iron rails, Cincinnati	24.00 to 25.00
Iron rails, St. Louis	27.00 to 27.50
Iron rails, Cleveland	29.00
Iron axles, Pittsburgh	39.00 to 41.00
Iron axles, Cincinnati	40.00 to 41.00
Iron axles, eastern Pa	38.00 to 40.00
Iron axles, Chicago	38.00 to 39.00
Iron axles, Buffalo	45.00
Low phos. steel, Buffalo	32.00 to 36.00
Low phos. steel, Pittsburgh	33.00 to 35.00
Low phos. steel, eastern Pa	31.00 to 32.00
Machine shop turnings, Buffalo	11.00 to 11.50
Mch. shop turnings, New York	11.75 to 12.25
Mch. shop turnings, Pittsburgh	11.75 to 12.25
Mch. shop turnings, eastern Pa	13.75 to 14.25
Mch. shop turnings, Birmingham	8.00 to 8.50
Malleable railroad, Cleveland	21.00 to 21.50
Malleable railroad, Buffalo	22.00 to 23.00
Malleable railroad, Pittsburgh	21.00 to 22.00
Malleable railroad, eastern Pa	16.50 to 17.00
R. R. and meh. cast, No. 1, Bfl.	22.50 to 23.00
R. R. wrought, No. 1, Buffalo	30.00 to 31.00
R. R. wrgt., No. 1, eastern Pa.	29.00 to 30.00
City wrought, New York	20.00 to 21.00
R. R. wrought, No. 1, Pbgh	23.00
R. R. wrought, No. 1, B'ham	18.00 to 19.00
Reroll. rails, 5 ft. & over, Pbgh.	28.00 to 30.00
Reroll. rails, 5 ft. & ov., Chgo.	26.00 to 26.50
Reroll. rails, 5 ft. & ov., E. Pa.	27.00 to 28.00
Reroll. rails, 5 ft. and ov., St. L.	26.50 to 27.00
Shafting, New York	25.00 to 25.50
Shafting, eastern Pa	27.00 to 28.00
Shoveling steel, Chgo	19.25 to 19.75
Shoveling steel, St. Louis	18.50 to 19.00
Steel rails, short, Chicago	24.00 to 24.50
Steel rails, short, Cleveland	23.50 to 24.00
Steel rails, over 6 ft., Cleveland	21.50 to 21.75
Steel rails, old, Birmingham	18.00 to 18.50
Steel rails, short, St. Louis	25.00 to 25.50
Steel car axles, Birmingham	35.00 to 36.00
Steel car axles, New York	38.00 to 40.00
Steel car axles, Buffalo	45.00
Steel car axles, Cleveland	43.50 to 44.00
Steel car axles, Pittsburgh	39.00 to 41.00
Steel car axles, eastern Pa	38.00 to 40.00
Stove plate, N. J. points	14.00 to 14.50
Stove plate, Birmingham	11.00 to 12.00
Stove plate, Buffalo	14.00 to 14.50
Stove plate, eastern Pa	16.00 to 17.00
Stove plate, Pittsburgh	15.00 to 15.50
Wrought pipe, Buffalo	16.00 to 16.50
Wrought pipe, eastern Pa	19.00 to 20.00
Wrought pipe, New York	17.00 to 18.00

"Where-To-Buy"

A classified-by-products list of advertisers for the convenience of readers. If you don't find what you want, write us and we will tell you where to get it. ¶ Index to advertisements will give you page number of any advertiser and by referring to advertisement you can get full particulars about products.

ACCUMULATORS.

Biggs-Watterson Co., The, Cleveland, O.
Birdsboro Steel Fdy. & Mch. Co., Birdsboro, Pa.
Chambersburg Engrg. Co., Chambersburg, Pa.
Mackintosh, Hemphill & Co., Pittsburgh, Pa.
Mesta Machine Co., Pittsburgh, Pa.
Morgan Engineering Co., Alliance, O.
Southwark Fdy. & Mch. Co., Philadelphia, Pa.
Tod, Wm., Youngstown, O.
United Engrg. & Fdy. Co., Pittsburgh, Pa.
Wood, R. D., & Co., Philadelphia, Pa.

ACETYLENE IN CYLINDERS.

Linde Air Products Co., New York City.
Oxweld Acetylene Co., Chicago, Ill.
Prest-O-Lite Co., The, Indianapolis, Ind.

ADAMITE ROLLS.

Pittsburgh Iron & Steel Foundries Co., Pittsburgh, Pa.

AEROPLANE WIRE, STRAND AND CORD.

American Steel & Wire Co., Chicago, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.

AIR SEPARATORS.

Raymond Bros. Impact Pulverizer Co., The, Chicago, Ill.

ALLOYS.

American Vanadium Co., Pittsburgh, Pa.
Bethlehem Steel Co., The, So. Bethlehem, Pa.
Blackwell, Geo. G., Sons & Co., Ltd., Liverpool, Eng.
Bourne-Fuller Co., The, Cleveland, O.
Carnegie Steel Co., Pittsburgh, Pa.
Central Steel Co., The, Massillon, O.
Haynes Stellite Co., The, Kokomo, Ind.
Standard Alloys Company, Pittsburgh, Pa.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
United Alloys Steel Corp., The, Canton, O.

ALUMINUM (Granulated).

United Smelt'g & Alum. Co., New Haven, Ct.

ALUMINUM (Solder).

United Smelt'g & Alum. Co., New Haven, Ct.

ALUMINUM (Vanadium).

American Vanadium Co., Pittsburgh, Pa.

ALUMINUM ALLOYS.

United Smelt'g & Alum. Co., New Haven, Ct.

ALUMINUM INGOTS.

United Smelt'g & Alum. Co., New Haven, Ct.

ALUMINUM RODS (Sheet).

United Smelt'g & Alum. Co., New Haven, Ct.

ANGLES, TEES, CHANNELS (See Steel, Structural).

ANNEALING BOXES AND POTS.

Blackwood Steel Fdy. Co., The, Springfield, O.
Knox Pressed & Welded Steel Co., Pittsburgh.
Mesta Machine Co., Pittsburgh, Pa.
Pittsburgh Annealing Box Co., Pittsburgh, Pa.
Pittsburgh Malleable Iron Co., Pittsburgh, Pa.
Pittsburgh Valve Foundry & Const. Co., Pittsburgh, Pa.
Swedish Crucible Steel Co., Detroit, Mich.
United Engrg. & Foundry Co., Pittsburgh, Pa.
Zanesville Malleable Iron Co., Zanesville, O.

ANTI-SLIP TREADS FOR STAIRS.

Pittsburgh Iron & Steel Foundries Co., Pittsburgh, Pa.

ARCHITECTURAL SHAPES.

Empire Art Metal Co., College Pt., N. Y.

ARMATURES.

General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

ASH BUCKETS.

Lakewood Engrg. Co., Cleveland, O.

AUTO TOWING CABLES.

American Steel & Wire Co., Chicago, Ill.

AUTO TRUCKS.

Federal Motor Truck Co., Detroit, Mich.

AXLES.

American Bridge Co., New York City.
American Steel Export Co., New York City.
Bethlehem Steel Co., The, So. Bethlehem, Pa.
Cambria Steel Co., Philadelphia, Pa.
Camden Forge Co., Camden, N. J.
Carnegie Steel Co., Pittsburgh, Pa.
Illinois Steel Co., Chicago, Ill.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
National Tube Co., Pittsburgh, Pa.
Otis Steel Co., Cleveland, O.

AXLE LATHES.

Bridgeford Mch. Tool Wks., Rochester, N. Y.

BABBITT METAL.

Keystone Bronze Co., Pittsburgh, Pa.
Lubricating Metal Co., The, New York City.
Ryerson, Jos. T., & Son, Chicago, Ill.

BAKERS, WIRE COATING.

Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

BALE TIES.

American Steel & Wire Co., Chicago, Ill.

BALLS (Steel).

Bethlehem Steel Co., The, So. Bethlehem, Pa.
New Departure Mfg. Co., Bristol, Conn.

BANDERS (Hydraulic for Projectiles).

Southwark Foundry & Mach. Co., Philadelphia.
West Tire Setter Co., The, Rochester, N. Y.

BANDS (Steel).

Akron-Selle Co., The, Akron, O.
Carnegie Steel Co., Pittsburgh, Pa.
Interstate Iron & Steel Co., Chicago, Ill.

BARGES (Steel).

American Bridge Co., New York City.

BARRELS, TUMBLING (Wire Nails).

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

BARS (Concrete Reinforcing).

Bourne-Fuller Co., Cleveland, O.
Carnegie Steel Co., Pittsburgh, Pa.
Cincinnati Iron & Steel Co., Cincinnati, O.
Franklin Steel Works, Franklin, Pa.
Inland Steel Co., Chicago, Ill.
Interstate Iron & Steel Co., Chicago, Ill.
Laclede Steel Co., St. Louis, Mo.
Ryerson, Jos. T., & Son, Chicago, Ill.
Trussed Concrete Steel Co., Detroit, Mich.
Upson Nut Co., Cleveland, O.
Witherow Steel Co., Pittsburgh, Pa.

BARS (Iron and Steel).

American Bridge Co., New York, N. Y.
American Iron & Steel Mfg. Co., Lebanon, Pa.
American Steel Export Co., New York City.
Belmont Iron Works, Philadelphia, Pa.
Bethlehem Steel Co., The, So. Bethlehem, Pa.
Bingham, W., Co., The, Cleveland, O.
Bourne-Fuller Co., Cleveland, O.
Brown-Wales Co., Boston, Mass.
Cambria Steel Co., Philadelphia, Pa.
Camden Forge Company, Camden, N. J.
Carnegie Steel Co., Pittsburgh, Pa.
Cincinnati Iron & Steel Co., Cincinnati, O.
Franklin Steel Works, Franklin, Pa.
Harvey, Arthur C., Co., Boston, Mass.
Illinois Steel Co., Chicago, Ill.
Illinois Steel Co., Warehouse Dept., Chicago.
Illinois Steel Warehouse Co., St. Louis, Mo.
Illinois Steel Warehouse Co., St. Paul, Minn.
Inland Steel Co., Chicago, Ill.
Interstate Iron & Steel Co., Chicago, Ill.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Lackawanna Steel Co., Buffalo, N. Y.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Milton Mfg. Co., Milton, Pa.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Joseph T., & Son, Chicago, Ill.
Scully Steel & Iron Co., Chicago, Ill.
Standard Gauge Steel Co., Beaver Falls, Pa.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Trussed Concrete Steel Co., Detroit, Mich.
United Alloys Steel Corp., The, Canton, O.
Upson Nut Co., Cleveland, O.
Westerman & Co., Lockport, N. Y.

BARS (Tin).

Andrews Steel Co., Newport, Ky.

BEAMS, CHANNELS AND ANGLES.

American Steel Export Co., New York City.
Belmont Iron Works, Philadelphia, Pa.
Bourne-Fuller Co., Cleveland, O.
Carnegie Steel Co., Pittsburgh, Pa.
Empire Art Metal Co., College Pt., N. Y.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., Chicago, Ill.
Interstate Iron & Steel Co., Chicago, Ill.
Ryerson, Joseph T., & Son, Chicago, Ill.
Scully Steel & Iron Co., Chicago, Ill.

BEARINGS (Ball).

New Departure Mfg. Co., Bristol, Conn.

BEARINGS (Vanadium Steel).

American Vanadium Co., The, Pittsburgh, Pa.

BELT CEMENT AND DRESSING.

Dixon, Jos., Crucible Co., Jersey City, N. J.
Graton & Knight Mfg. Co., Worcester, Mass.
Texas Company, The, New York City.

BELT LACING (Leather).

Chicago Rawhide Mfg. Co., Chicago, Ill.
Graton & Knight Mfg. Co., Worcester, Mass.

BELTING (Chain).

Link-Belt Company, Chicago, Ill.

BELTING (Leather).

Bingham, W., Co., The, Cleveland, O.
Chicago Rawhide Mfg. Co., Chicago, Ill.
Graton & Knight Mfg. Co., Worcester, Mass.

BENCHES (Steel).

New Britain Mach. Co., New Britain, Conn.

BENCHES AND FRAMES (Drawing).

Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., The, Cuyahoga Falls, O.

BENDING AND STRAIGHTENING MACHINES.

Abramsen Engrg. Co., Pittsburgh, Pa.
Bertsch & Co., Cambridge City, Ind.
Birdsboro St'l Fdy. & Mch. Co., Birdsboro, Pa.
Cleveland Punch & Shear Works Co., Cleveland, O.
Espen-Lucas Machine Works, Philadelphia, Pa.
Hinman, D. A., & Co., Sandwich, Ill.
Lourie Mfg. Co., Springfield, Ill.
Mackintosh, Hemphill & Co., Pittsburgh, Pa.
Morgan Engineering Co., Alliance, O.
Niles-Rement-Pond Co., New York, N. Y.
United Engrg. & Fdy. Co., Pittsburgh, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above